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In reply, please refer to:
EMD/CWB

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DATE: August 13, 2014
NPDES PERMIT NO. HI 0020117

FACT SHEET: APPLICATION FOR RENEWAL OF NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND ZONE OF MIXING (ZOM) TO DISCHARGE TO MAMALA BAY, PACIFIC OCEAN, WATERS OF THE UNITED STATES

PERMITTEE: CITY AND COUNTY OF HONOLULU

FACILITY: SAND ISLAND WASTEWATER TREATMENT PLANT

FACILITY MAILING ADDRESS
City and County of Honolulu
Sand Island Wastewater Treatment Plant
1000 Uluohia Street, Suite 308
Kapolei, Hawaii 96707

FACILITY STREET ADDRESS
City and County of Honolulu
Sand Island Wastewater Treatment Plant
1350 Sand Island Parkway
Honolulu, Hawaii 96819

PERMITTEE MAILING ADDRESS
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Kapolei, Hawaii 96707
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City and County of Honolulu
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Table of Contents

This Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of the draft permit.

A. Permit Information

The following table summarizes administrative information related to the Sand Island Wastewater Treatment Plant (hereinafter, facility).

Table F-1. Facility Information

Permittee	City and County of Honolulu
Name of Facility	Sand Island Wastewater Treatment Plant
Facility Address	1350 Sand Island Parkway Honolulu, HI 96707
Facility Contact, Title, and Phone	Lori M.K. Kahikina, Director, (808) 768-8481
Authorized Person to Sign and Submit Reports	Lori M.K. Kahikina, Director, (808) 768-8481
Mailing Address	1000 Ulouhia St, Suite 308 Kapolei, HI 96707
Billing Address	Same as above
Type of Facility	Wastewater Treatment Plant
Pretreatment Program	Yes
Reclamation Requirements	No
Facility Design Flow	90 million gallons per day (MGD)
Receiving Waters	Mamala Bay, Pacific Ocean
Receiving Water Type	Marine
Receiving Water Classification	Class A Wet Open Coastal Waters (HAR, Section 11-54-06(b)(2)(B))

1. NPDES Permit No. HI 0020117, including ZOM, became effective on November 2, 1998, and expired on November 3, 2003. The Permittee submitted an application for continued 301(h) variance on May 5, 2003. The Permittee reapplied for an NPDES permit and ZOM on December 21, 2010, with additional information submitted on May 16, 2011, September 16, 2011, March 14, 2012, March 23, 2012, April 3, 2012, and June 19, 2013.

2. The Director of Health (hereinafter Director) proposes to issue a permit to discharge to the waters of the state until **five (5) years from the date of issuance,** and has included in the proposed permit those terms and conditions which are necessary to carry out the provisions of the Federal Water Pollution Control Act (P.L. 92-500), Federal Clean Water Act (CWA) (P.L. 95-217) and Chapter 342D, Hawaii Revised Statutes.

B. Facility Setting

1. Facility Operation and Location

The Permittee owns and operates the facility, located in Honolulu, Hawaii, on the island of Oahu. The facility has a design capacity of 90 MGD and provides

primary treatment of wastewater for approximately 405,000 people in the Sand Island Basin. Influent wastewater enters the facility and is distributed to a minimum of two (2) of six (6) available aerated screening channels, where screening and flow measurement using Parshall flumes occur. From there, wastewater is directed to the clarifiers' influent channels for primary treatment. The clarifiers' influent channels distribute wastewater to eight 150-foot diameter primary clarifiers. At normal flow, four clarifiers are in use. Primary treated wastewater is then piped to effluent screens and then to disinfection. The facility contains five (5) available dual bank high pressure ultraviolet (UV) disinfection channels. After disinfection, treated effluent is discharged to Mamala Bay, Pacific Ocean, through Outfall Serial No. 001, at Latitude 21°17'01"N and Longitude 157°54'24"W.

Outfall Serial No. 001 is an 84-inch diameter deep ocean outfall that discharges treated effluent through a diffuser that starts approximately 9,100 feet offshore and 230 feet below the surface of the water. The diffuser is approximately 3,400 feet long with 282 side ports that range in size from 3 inches to 3.53 inches in diameter and two 7-inch diameter ports in the end gate.

Sludge processing at the facility consists of gravity thickeners, wet sludge storage tanks, and a digester. Biosolids are processed onsite by an independent contractor.

Storm water from the facility is regulated under the City and County of Honolulu's municipal separate storm sewer (MS4) permit, NPDES Permit No. HIS000002.

Figure 1 of the draft permit provides a map showing the location of the facility. Figure 2 of the draft permit provides a map of the Zone of Mixing (ZOM), Zone of Initial Dilution (ZID), and receiving water monitoring station locations.

2. Receiving Water Classification

The Mamala Bay, Pacific Ocean, is designated as "Class A Wet Open Coastal Waters" under Section 11-54-06(b)(2)(B), Hawaii Administrative Rules (HAR). Protected beneficial uses of Class A waters include recreation, aesthetic enjoyment, and the protection and propagation of fish, shellfish, and wildlife.

3. Ocean Discharge Criteria

The Director has considered the Ocean Discharge Criteria, established pursuant to Section 403(c) of the CWA for the discharge of pollutants into the territorial sea, the waters of the contiguous zone, or the oceans. The United States Environmental Protection Agency (EPA) has promulgated regulations for Ocean Discharge Criteria in 40 Code of Federal Regulations (CFR) Part 125, Subpart M. The Director has determined that the discharge will not cause unreasonable

degradation to the marine environment. Based on the current information, the Director proposes to issue a permit.

4. Impaired Water Bodies on CWA 303(d) List

CWA Section 303(d) requires states to identify specific water bodies where water quality standards are not expected to be met after implementation of technology-based effluent limitations on point sources.

On September 20, 2013, the EPA approved the 2012 State of Hawaii Water Quality Monitoring and Assessment Report, which includes the 2012 303(d) List of Impaired Water Bodies in the State of Hawaii.

The Mamala Bay (off shore) is not listed as an impaired water body for any pollutants in the 2012 303(d) list. Currently, this section of Mamala Bay is reported as a Category 2 waterbody. At present, no TMDLs have been established for this waterbody.

5. Summary of Existing Effluent Limitations

a. Existing Effluent Limitations and Monitoring Data

Effluent limitations contained in the existing permit for discharges from Outfall Serial No. 001 and representative monitoring data from October 2006 through December 2013, are presented in the following tables.

Table F-2. Historic Effluent Limitations and Monitoring Data – Outfall Serial No. 001

Parameter	Units	Effluent Limitation			Reported Data[1]		
		Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily
Flow	MGD	[2]	[2]	[2]	76	98	149
Biochemical Oxygen Demand (5-Day)	mg/L	116[3]	160[3]	[2]	128[4]	134[4]	180[4]
	lbs/day	79,330[3]	109,421[3]	[2]	64,653[4]	69,327[4]	107,544[4]
	mg/L	119[5]	122[5]	[2]	128[6]	137[6]	161[6]
	lbs/day	89,414[5]	91,594[5]	[2]	60,361[6]	66,022[6]	75,827[6]
	% Removal	As a monthly average, not less than 30 percent removal efficiency from influent stream.			28[7]		
Total Suspended Solids	mg/L	69[3]	104[3]	[2]	48[4]	59[4]	90[4]
	lbs/day	47,187[3]	71,124[3]	[2]	27,194[4]	31,519[4]	71,950[4]
	mg/L	48[5]	50[5]	[2]	49[6]	53[6]	70[6]
	lbs/day	36,349[5]	37,403[5]	[2]	24,434[6]	31,874[6]	67,274[6]
	% Removal	As a monthly average, not less than 60 percent removal efficiency from influent stream.			71[7]		
Enterococci	CFU/100 ml	[8]	[8]	18,000[8]	--	16,431[9]	90,500
Total Residual Chlorine	µg/L	[2]	[2]	64[8]	[10]	[10]	[10]

[1] Source: Highest reported values from monthly DMR's submitted by the Permittee from December 2006 through June 2011.
[2] No effluent limitations for this pollutant in the previous permit, only monitoring required.
[3] Effluent limitations contained in the previous permit.
[4] Data reported from October 2006 until November 2010.
[5] Interim effluent limitations contained in the 2010 Consent Decree. Interim effluent limitations are applicable until deadlines established in the 2010 Consent Decree.
[6] Data reported from December 2010 through December 2013.
[7] Data represent minimum percent removal reported.
[8] Effluent limitation for enterococci became effective on July 21, 2002.
[9] Reported as a geometric mean. Only represents data since the ultraviolet disinfection system became effective in November 2006.
[10] The previous permit required the Permittee to monitor total residual chlorine upon initiation of chlorination if the Permittee determined that the appropriate disinfection technology to achieve disinfection is chlorination. In November 2006, the Permittee started using UV disinfection; therefore, the Permittee did not submit total residual chlorine data.

Table F-3. Historic Effluent Limitations and Monitoring Data – Outfall Serial No. 001

Parameter	Units	Effluent Limitation			Reported Data[1]		
		Average Annual	Average Monthly	Average Daily	Average Annual	Average Monthly	Average Daily
Oil and Grease	mg/L	--	[2]	[2]	--	21.9	79.1
	lbs/day	--	[2]	[2]	--	12,154	44,355
Total Petroleum Hydrocarbons	mg/L	--	[2]	[2]	--	9.5	18.3
	lbs/day	--	[2]	[2]	--	5,192	9,881
Fats, Oils, and Greases	mg/L	--	[2]	[2]	--	12.5	63.8
	lbs/day	--	[2]	[2]	--	6,962	35,777
Temperature	°C	--	[2]	[2]	--	28.2	30.4
Total Nitrogen	mg/L	[2]	[2]	NA	24	29.2	--
	lbs/day	[2]	[2]	NA	13,351	14,339	--
Total Phosphorus	mg/L	[2]	[2]	NA	3.15[3]	3.72[3]	--
	lbs/day	[2]	[2]	NA	1,724[3]	1,942[3]	--
pH	s.u.	Not less than 6.0 nor greater than 9.0			6.45 – 7.49		
Chronic Toxicity – *Ceriodaphnia Dubia*	TUc	NA	NA	94	--	--	46
Chronic Toxicity – *Tripneustes Gratilla*	TUc	NA	NA	[4]	--	--	1428.6
Chlordane	µg/L	0.0076	NA	0.38	0.0902	--	0.308
	lbs/day	0.0052	NA	0.26	0.0532	--	0.308
Dieldrin	µg/L	0.012	NA	0.18	0.037	--	0.172
	lbs/day	0.0082	NA	0.12	0.0242	--	0.172

[1] Source: Highest reported values from monthly DMR's submitted by the Permittee from October 2006 through December 2013. Data for Enterococci is limited to data between January 2007 through December 2013 to represent only data since ultraviolet disinfection came online in November 2006.
[2] No effluent limitations for this pollutant in the previous permit, only monitoring required.
[3] Reported by the Permittee as total phosphate.
[4] The chronic toxicity discharge limitation of 94 TUc listed in Part A.1 of the previous permit does not apply to monitoring results for toxicity tests using *Trypneustes gratilla*.

6. Compliance Summary

The following table lists effluent limitation violations as identified in the monthly, quarterly, and annual DMRs submitted by the Permittee from December 2006 to April 2011.

Table F-4. Summary of Compliance History

Monitoring Period	Violation Type	Pollutant	Reported Value	Permit Limitation	Units
October 2006 – July 2011	Annual Average	Chlordane	[1]	0.0076	µg/L
October 2006 – July 2011	Annual Average	Chlordane	[1]	0.0052	lbs/day
October 2006 – July 2011	Annual Average	Dieldrin	[2]	0.012	µg/L
October 2006 – July 2011	Annual Average	Dieldrin	[2]	0.0082	lbs/day
October 2006 – July 2011	Annual Average	Enterococci	[3]	18,000	CFU/100 mL
March 2007	Monthly Average	BOD_5	117	116	mg/L
June 2007	Monthly Average	BOD_5	119	116	mg/L
October 2007	Monthly Average	BOD_5	120	116	mg/L
February 2010	Monthly Average	BOD_5	118	116	mg/L
March 2010	Monthly Average	BOD_5	119	116	mg/L
March 2011	Weekly Average	BOD_5	125	122	mg/L
March 2011	Weekly Average	BOD_5	124	122	mg/L
May 2011	Weekly Average	BOD_5	124	122	mg/L
May 2011	Monthly Average	BOD_5	120	119	mg/L

[1] Chlordane samples exceeded the concentration and mass-based annual average effluent limitations 52 times from October 2006 through July 2011. Effluent limitations in the current permit for chlordane were based on a human health water quality standard that was printed incorrectly in HAR, Chapter 11-54, and thus effluent limitations were 10 times smaller than necessary to protect the receiving water beneficial uses. The water quality standards have been amended in HAR, Chapter 11-54, and the draft permit will reflect this amendment.

[2] Dieldrin samples exceeded the concentration-based annual average effluent limitations 52 times and mass-based annual average effluent limitations 44 times from October 2006 through July 2011.

[3] Enterococci samples exceeded daily maximum effluent limitation 35 times from October 2006 through July 2011.

7. December 2010 United States of America v. City and County of Honolulu Consent Decree (2010 Consent Decree)

On May 15, 1995, the U.S. District Court for the District of Hawaii entered a Consent Decree requiring the facility to undertake certain steps to remedy CWA violations alleged in a Supplemental Complaint written on behalf of the EPA and DOH on October 3, 1994 (hereinafter, "the 1994 Complaint" and "the 1995 Consent Decree"). The 1995 Consent Decree required the facility to undertake specific actions to improve conditions in its wastewater collection system, though, among other things, implementing comprehensive collection system maintenance and capacity programs, and to undertake two (2) Supplemental Environmental Projects. After various complaints from the Sierra Club, Hawaii's Thousand Friends, and Our Children's Earth Foundation (hereinafter, Interveners), the Court entered a Stipulated Order on October 10, 2007. After several more complaints, all parties agreed on a new Consent Decree entered on December 17, 2010 (2010 Consent Decree), which replaced the 1995 Consent Decree and the 2007 Stipulated Order, and terminated all complaints from the Interveners.

In addition to the collection system upgrades the facility is required to undergo, the 2010 Consent Decree requires the Permittee to withdraw any appeals of EPA's denial of its application for a permit pursuant to Section 301(h) of the Clean Water Act, which allows a waiver from secondary treatment for ocean discharges. The 2010 Consent Decree requires the Permittee to complete construction of facilities necessary to comply with secondary treatment standards by no later than December 31, 2038, and sets forth interim compliance milestones and interim effluent limitations for BOD_5 and TSS until the facility achieves compliance with secondary treatment standards.

8. Planned Changes

In accordance with the 2010 Consent Decree, the Permittee is required to complete various plant upgrades necessary to comply with secondary standards. The deadlines for completing the upgrades are as follows:

Table F-5. 2010 Consent Decree Deadlines

Deadline	Requirement
1/1/2019	Execute a design contract, and issue a notice to proceed with design.
1/1/2022	Execute a construction contract, and issue a notice to proceed with construction.
1/1/2024 to 12/31/2025	If required, submit a proposal and financial analyses to extend deadline to no later than 12/31/2038.
1/1/2030	If the 2022 notice to proceed does not include all work due to phasing of the project, execute construction contract(s) and issue notice(s) to proceed for remaining work.
12/31/2035	Complete construction of facilities, unless proposal for deadline extension was approved.

Extended deadline no later than 12/31/2038	If proposal for extended deadline was approved, complete construction of facilities by that deadline.

The 2010 Consent Decree is provided in Attachment A to this Fact Sheet.

C. Applicable Plans, Policies, and Regulations

1. Hawaii Administrative Rules, Chapter 11-54

On November 12, 1982, the Hawaii Administrative Rules, Title 11, Department of Health, Chapter 54 became effective (hereinafter HAR, Chapter 11-54). HAR, Chapter 11-54 was amended and compiled on October 6, 1984; April 14, 1988; January 18, 1990; October 29, 1992; April 17, 2000; October 2, 2004; June 15, 2009; and the most recent amendment was on October 21, 2012. HAR, Chapter 11-54 establishes beneficial uses and classifications of state waters, the state anti-degradation policy, zones of mixing standards, and water quality criteria that are applicable to Honolulu Harbor.

Requirements of the draft permit implement HAR, Chapter 11-54.

2. Hawaii Administrative Rules, Chapter 11-55

On November 27, 1981 HAR, Title 11, Department of Health, Chapter 55 became effective (hereinafter HAR, Chapter 11-55). HAR Chapter 11-55 was amended and compiled on October 29, 1992; September 22, 1997; January 6, 2001; November 7, 2002; August 1, 2005; October 22, 2007; June 15, 2009 and the most recent amendment was on October 21, 2012. HAR, Chapter 11-55 establishes standard permit conditions and requirements for NPDES permits issued in Hawaii.

Requirements of the draft permit implement HAR, Chapter 11-55.

3. State Toxics Control Program

NPDES Regulations at 40 CFR 122.44(d) require permits to include water quality-based effluent limitations (WQBELs) for pollutants, including toxicity, that are or may be discharged at levels that cause, have reasonable potential to cause, or contribute to an exceedance of a water quality standard. The *State Toxics Control Program: Derivation of Water Quality-Based Discharge Toxicity Limits for Biomonitoring and Specific Pollutants* (hereinafter, STCP) was finalized in April, 1989, and provides guidance for the development of water quality-based toxicity control in NPDES permits by developing the procedures for translating water quality standards in HAR, Chapter 11-54, into enforceable NPDES permit limitations. The STCP identifies procedures for calculating permit limitations for specific toxic pollutants for the protection of aquatic life and human health.

Guidance contained in the STCP was used to determine effluent limitations in the draft permit.

D. Rationale for Effluent Limitations and Discharge Specifications

The CWA requires point source Permittees to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. NPDES regulations establish two (2) principal bases for effluent limitations. At 40 CFR 122.44(a), permits are required to include applicable technology-based limitations and standards; and at 40 CFR 122.44(d), permits are required to include WQBELs to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. When numeric water quality objectives have not been established, but a discharge has the reasonable potential to cause or contribute to an excursion above a narrative criterion, WQBELs may be established using one (1) or more of three (3) methods described at 40 CFR 122.44(d) – 1) WQBELs may be established using a calculated water quality criterion derived from a proposed state criterion or an explicit state policy or regulation interpreting its narrative criterion; 2) WQBELs may be established on a case-by-case basis using EPA criteria guidance published under CWA Section 304(a); or 3) WQBELs may be established using an indicator parameter for the pollutant of concern.

1. Technology-Based Effluent Limitations

a. Scope and Authority

Section 301(b) of the CWA and implementing EPA permit regulations at 40 CFR 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this permit must meet minimum federal technology-based requirements based on Secondary Treatment Standards at 40 CFR 133.

Regulations promulgated in 40 CFR 125.3(a)(1) require technology-based effluent limitations for municipal Permittees to be placed in NPDES permits based on Secondary Treatment Standards or Equivalent to Secondary Treatment Standards.

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) established the minimum performance requirements for publically owned treatment works (POTWs) [defined in section 304(d)(1)]. CWA Section 301(b)(1)(B) requires that such treatment works must, as a minimum, meet effluent limitations based on secondary treatment as defined by the EPA Administrator.

Based on this statutory requirement, EPA developed secondary treatment regulations, which are specified in 40 CFR 133. These technology-based regulations apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH.

b. Applicable Technology-Based Effluent Limitations

During the drafting of the previous permit, the EPA granted a 301(h) variance from secondary treatment requirements for the facility. As a result, BOD_5 and TSS effluent limitations contained in the previous permit were less stringent than secondary treatment standards and were based on data collected at the facility from January 1993 through December 1997.

On May 5, 2003, the Permittee submitted an application for renewal of its 301(h) variance along with an application for renewing the NPDES permit. On February 9, 2009, the EPA's decision to deny the Permittee's application for a 301(h) variance became effective. The denial was on the ground that the EPA concluded that the applicant's proposed discharge will not comply with the requirements of CWA Section 301(h) and 40 CFR 125, Subpart G, and the water quality standards of HAR, Chapter 11-54. Therefore, technology-based effluent limitations in the draft permit are based on secondary treatment standards contained in 40 CFR 133, as described below.

At 40 CFR 133 in the Secondary Treatment Regulations, EPA has established the minimum required level of effluent quality attainable by secondary treatment shown in Table F-6 below. The standards in Table F-6 are applicable to the facility and therefore established in the draft permit as technology-based effluent limitations.

Table F-6. Applicable Technology-Based Effluent Limitations

Parameter	Units	30-Day Average	7-Day Average
BOD_5[1]	mg/L	30	45
TSS[1]	mg/L	30	45
pH	standard units	6.0 – 9.0	

[1] The 30-day average percent removal shall not be less than 85 percent.

However, Paragraph 31 of the 2010 Consent Decree establishes interim effluent limitations and monitoring requirements for Sand Island for flow, BOD_5 and TSS. Paragraph 32 of the 2010 Consent Decree specifically states, *"From the Effective Date of this Consent Decree until the final compliance milestone set pursuant to Paragraph 31 for the Sand Island*

WWTP, CCH shall comply with the requirements and interim effluent limits for TSS and BOD5 set forth for the Sand Island WWTP, notwithstanding any final effluent limitations for TSS and BOD5 set forth in CCH's applicable NPDES permit for the Sand Island WWTP; provided, however, that this Consent Decree shall not affect the force or effect of any other effluent limitations, or monitoring and reporting requirements, or any other terms and conditions of its applicable NPDES permit."

The Consent Decree requirements for BOD and TSS supersede the applicable TBELs until the deadline established in the Consent Decree.

2. Water Quality-Based Effluent Limitations (WQBELs)

a. Scope and Authority

NPDES Regulations at 40 CFR 122.44(d) require permits to include WQBELs for pollutants, including toxicity, that are or may be discharged at levels that cause, have reasonable potential to cause, or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard (reasonable potential). As specified in 40 CFR 122.44(d)(1)(i), permits are required to include WQBELs for all pollutants "which the Director determines are or may be discharged at a level that will cause, have reasonable potential to cause, or contribute to an excursion above any state water quality standard."

The process for determining reasonable potential and calculating WQBELs, when necessary, is intended to protect the receiving waters as specified in HAR, Chapter 11-54. When WQBELs are necessary to protect the receiving waters, the DOH has followed the requirements of HAR, Chapter 11-54, the STCP, and other applicable State and federal guidance policies to determine WQBELs in the draft permit.

Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELS must be established in accordance with the requirements of 40 CFR 122.44(d)(1)(vi), using (1) EPA criteria guidance under CWA Section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information.

b. Applicable Water Quality Standards

The beneficial uses and water quality standards that apply to the receiving waters for this discharge are from HAR, Chapter 11-54.

(1) HAR, Chapter 11-54. HAR, Chapter 11-54 specifies numeric aquatic life standards for 72 toxic pollutants and human health standards for 60 toxic pollutants, as well as narrative standards for toxicity. Effluent limitations and provisions in the draft permit are based on available information to implement these standards.

(2) Water Quality Standards. The facility discharges to the Mamala Bay, Pacific Ocean, which is classified as a Marine Class A Wet Open Coastal Waters in HAR, Chapter 11-54. As specified in HAR, Chapter 11-54, saltwater standards apply when the dissolved inorganic ion concentration is above 0.5 parts per thousand. As such, a reasonable potential analysis (RPA) was conducted using saltwater standards. Additionally, human health water quality standards were also used in the RPA to protect human health. Where both saltwater standards and human health standards are available for a particular pollutant, the more stringent of the two (2) will be used in the RPA.

40 CFR 122.45(c) requires effluent limitations for metals to be expressed as total recoverable metal. Since water quality standards for metals are expressed in the dissolved form in HAR, Chapter 11-54, factors or translators must be used to convert metal concentrations from dissolved to total recoverable. Default EPA conversion factors were used to convert the applicable dissolved criteria to total recoverable.

(3) Receiving Water Hardness. HAR, Chapter 11-54 contains water quality criteria for six (6) metals that vary as a function of hardness in freshwater. A lower hardness results in a lower freshwater water quality standard. The metals with hardness dependent standards include cadmium, copper, lead, nickel, silver, and zinc. Ambient hardness values are used to calculate freshwater water quality standards that are hardness dependent. Since saltwater standards are used for the RPA, the receiving water hardness was not taken into consideration when determining reasonable potential.

c. Determining the Need for WQBELs

NPDES regulations at 40 CFR 122.44(d) require effluent limitations to control all pollutants which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard. Assessing whether a pollutant has reasonable potential is the fundamental step in determining whether or not a WQBEL is

required. Using the methods prescribed in EPA's *Technical Support Document for Water Quality-Based Toxics Control* (the TSD, EPA/505/2-90-001, 1991), the effluent data from Outfall Serial No. 001 was analyzed to determine if the discharge demonstrates reasonable potential. The RPA compared the effluent data with numeric and narrative water quality standards in HAR, Chapter 11-54-4. To determine reasonable potential for nutrients contained in HAR, Chapter 11-54-6, a direct comparison of the receiving water concentrations at the edge of the ZOM was compared to the most stringent WQS.

(1) Reasonable Potential Analysis (RPA). The RPA for pollutants with WQS specified in HAR, Chapter 11-54-4, based on the TSD, combines knowledge of effluent variability as estimated by a coefficient of variation with the uncertainty due to a limited number of data to project an estimated maximum receiving water concentration as a result of the effluent. The estimated receiving water concentration is calculated as the upper bound of the expected lognormal distribution of effluent concentrations at a high confidence level. The projected maximum receiving water concentration, after consideration of dilution, is then compared to the WQS in HAR, Chapter 11-54, to determine if the pollutant has reasonable potential. The projected maximum receiving water concentration has reasonable potential if it cannot be demonstrated with a high confidence level that the upper bound of the lognormal distribution of effluent concentrations is below the receiving water standards.

Because the most stringent WQS for pollutants specified in HAR, Chapter 11-54-6, are provided as geometric means and exceedances of these WQS are less sensitive to effluent variability, the RPA was conducted by doing a direct comparison of the maximum effluent concentration to the most stringent applicable WQS.

(2) Effluent Data. The RPA was based on the effluent monitoring data submitted to the DOH in DMRs from October 2006 through February 2011.

(3) Dilution. The STCP discusses dilution, defined as the reduction in the concentration of a pollutant or discharge which results from mixing with the receiving waters, for submerged and high-rate outfalls. The STCP states that minimum dilution is used for establishing effluent limitations based on chronic criteria and human health standards for non-carcinogens, and average conditions is used for establishing effluent limitations based on human health standards for carcinogens.

The previous permit included a dilution of 94:1 (seawater: effluent) for limitations based on saltwater chronic criteria and human health criteria for non-carcinogens, and 476:1 for human health criteria for carcinogens. In EPA's December 2007 301(h) Waiver Tentative Decision Document for

Sand Island (TDD), EPA conducted dilution modeling for the facility using Visual PLUMES Three-Dimensional Updated Merge model. EPA evaluated 33 receiving water temperature and salinity depth profiles from February 1999 through April 2007 to determine the critical initial dilution for the Permittee's discharge. During this modeling effort, EPA determined that the temperature and salinity depth profile from July 2, 2002 was appropriate to use in the modeling effort because it represents a conservative estimate of ambient conditions into which the Permittee discharges, and thus would be protective of water quality. The use of less conservative ambient profiles may result in an initial dilution that is not fully protective of water quality standards under some discharge conditions. Further, this approach is consistent with EPA's *Initial Mixing Characteristic of Municipal Ocean Discharges*, which indicates that "worst-case" conditions be evaluated using a combination of conservative values for conditions affecting initial dilution.

Using conservative estimates for each input parameter, as described within the TDD, EPA determined a critical short-term initial dilution of 103:1 was appropriate to be applied to chronic and fish consumption criteria for non-carcinogens, and the average dilution of 294:1 is appropriate for fish consumption criteria for carcinogens such as chlordane and dieldrin.

On September 14, 2011, the Permittee submitted a dilution study for the facility. The study used the Visual PLUMES Three-Dimensional Updated Merge model for dilution calculations, and considered quarterly ambient data from 2006 through 2009 (for a total of 16 data sets). A number of concerns were identified with the submitted study:

- The Permittee did not use actual ambient salinity data within the ambient profiles, and instead used a constant salinity value of 34.99 psu throughout the water column. This is significant because density gradients (to which salinity is an important factor) may have a large impact on available initial dilution within the receiving water. Dilution modeling guidance within the 301(h) waiver TSD states that initial dilution calculations can be strongly dependent on the vertical gradient of ambient density, and larger applicants should evaluate a substantial amount of data from both the discharge site and nearby areas that have similar environmental conditions before selection a "worst-case density profile".

- When determining the average dilution, the Permittee did not use the design flow rate of the facility, as specified in section II.B.1 of the STCP.

- The Permittee did not consider available ambient data prior to 2006, and evaluated less than half the ambient profiles than those used within EPA's modeling effort. A smaller data set is less likely to account for potential environmental conditions that might limit initial dilution.

- The dilution study failed to consider effluent salinity. Effluent temperature and salinity are important factors when evaluating how the density of the effluent and how it will disperse through the vertical ambient water column.

Because of the deficiencies discussed above, the Permittee's September 14, 2011 dilution study, EPA's 2007 dilution study has been determined to be more defendable and thus applicable for permit development. The major deficiencies were discussed with the Permittee during the permit renewal process. As such, the Permittee resubmitted an April 3, 2012 dilution study.

As with the two previously discussed modeling efforts, the Permittee used Visual PLUMES Three-Dimensional Updated Merge model for the April 3, 2012 dilution study. Within in the April 3, 2012 dilution study, the Permittee used temperature and salinity ambient profiles from 2007 through 2011, for a total of 20 ambient density profiles. Multiple concerns were identified in the resubmitted study, including:

- The Permittee did not use reasonable worst-case conditions, using a combination of conservative values for all the conditions that impact initial dilution, specifically effluent salinity.

- When determining the average dilution, the Permittee did not use the design flow rate of the facility, as specified in Section II.B.1 of the STCP.

Additionally, the Permittee's most recent dilution analysis considered fewer ambient density profiles than EPA's analysis.

DOH acknowledges the importance of using recent ambient and effluent data and model input values that accurately reflect current facility operations. However, using the most recent study to evaluate reasonable potential or establish effluent limitations is not always appropriate. In this case, EPA's dilution analysis remains a valid analysis that accurately represents current facility operations and considered accurate and recent ambient density profiles. EPA's study considered a greater number of ambient profiles over a longer time period, and is more likely to capture conservative conditions that may reduce available dilution.

Because of the concerns identified with the Permittee's two dilution studies, and considering that EPA's dilution study continues to be representative, EPA's dilution analysis results have been used in the development of this permit.

Consistent with the STCP and EPA's approach in the TDD, DOH has determined the critical short-term initial dilution of 103:1 is applicable for chronic and fish consumption criteria for non-carcinogens, and the average dilution of 294:1 is applicable for fish consumption criteria for carcinogens.

HAR, Chapter 11-54-9, allows the use of a ZOM to demonstrate compliance with WQS. ZOMs consider initial dilution, dispersion, and reactions from substances which may be considered to be pollutants. However, due to other potential sources of pollutants into the receiving water, such as storm water runoff or unidentified discharges, it is often problematic to determine the cause of WQS exceedances in the receiving water at the edge of a ZOM. It is more practical to determine the available dilution provided in the ZOM and apply that dilution to the WQS to calculate an effluent limitation that can be applied end-of-pipe.

However, an available dilution at the edge of the ZOM that accounts for assimilative capacity is not currently known for this discharge. Thus, for Section 11-54-6 parameters, reasonable potential to contribute to an exceedance of WQS is most reasonably assessed by comparing monitoring data at the edge of the ZOM to the applicable WQS. If an annual geometric mean at the edge of a ZOM exceeds the applicable WQS, the Permittee is determined to have reasonable potential for the pollutant. If an exceedance of WQS is not observed at the edge of the ZOM, it is assumed that sufficient dilution and assimilative capacity exists to meet WQS at the edge of the ZOM.

Where reasonable potential has been determined for Section 11-54-6 pollutants, limitations must be established that are protective of water quality. Because the available dilution at the edge of the ZOM is not known, where assimilative capacity exists this permit establishes limitations for Section 11-54-6 pollutants as performance-based effluent limitations and receiving water limitations and requires the Permittee to conduct a dilution analysis at the edge of the ZOM so that end-of-pipe effluent limitations may be established during future permitting efforts. Where assimilative capacity does not exist, it is not appropriate to grant a ZOM and/or dilution, and an end-of-pipe criteria-based effluent limitation must be established that is protective of WQS.

Assimilative capacity for pollutants with reasonable potential is evaluated for Section 11-54-6 pollutants by aggregating all ZOM control station data

annually and comparing the annual geometric means to the applicable WQS. If an annual geometric mean exceeds 90 percent of the WQS, assimilative capacity is determined to be insufficient and dilution may not be granted.

(4) Summary of RPA Results. The maximum effluent concentrations from the DMRs over the current permit term and the NPDES Application Form 2C, maximum projected receiving water concentration after dilution calculated using methods from the TSD, the applicable HAR, Section 11-54-4(b)(3) and 11-54-6(b)(3) water quality standard, and result of the RPA for pollutants discharged from Outfall Serial No. 001 is presented in Table F-7, below. The maximum projected concentrations for toxics specified in HAR, Section 11-54-4 have been revised to reflect available dilution. For nutrients and water quality standards specified in HAR, Section 11-54-6(b)(3), dilution, where available, has been accounted for within the summarized applicable water quality standard. Only pollutants detected in the discharge are presented in Table F-7. All other pollutants were not detected and therefore, no reasonable potential exists.

Table F-7. Summary of RPA Results

Parameter	Units	Number of Samples	Dilution	Maximum Effluent Concentration	Maximum Projected Concentration	Applicable Water Quality Standard	RPA Results
Antimony, Total Recoverable	µg/L	14	103	1.6	0.054	15,000	No
Arsenic, Total Recoverable	µg/L	14	103	1.5	0.031	36	No
Beryllium, Total Recoverable	µg/L	14	294	0.44	0.018	0.038	No
Cadmium, Total Recoverable	µg/L	14	103	0.13	0.008	9.4	No
Chromium, Total Recoverable	µg/L	14	103	4.8	0.080	50[1]	No
Copper, Total Recoverable	µg/L	14	103	40	1.096	3.5	No
Cyanide, Total Recoverable	µg/L	14	103	10	0.449	1.0	No
Lead, Total Recoverable	µg/L	14	103	19	1.728	5.9	No
Mercury, Total Recoverable	µg/L	14	103	0.06	0.0018	0.025	No
Nickel, Total Recoverable	µg/L	14	103	5.9	0.120	8.4	No
Selenium, Total Recoverable	µg/L	14	103	1.2	0.387	71	No
Silver, Total Recoverable	µg/L	14	103	0.80	0.030	2.7	No
Thallium, Total Recoverable	µg/L	14	103	2.2	0.233	16	No
Zinc, Total Recoverable	µg/L	14	103	85	1.729	91	No
Acrolein	µg/L	14	103	1.4	0.045	18	No
Benzene	µg/L	14	294	4.8	0.104	13	No

Parameter	Units	Number of Samples	Dilution	Maximum Effluent Concentration	Maximum Projected Concentration	Applicable Water Quality Standard	RPA Results
Bis(2-Ethylhexyl) Phthalate	µg/L	14	103	1.3	0.013	16,000	No
Chlordane	µg/L	81	294	0.28	0.00164	0.00016	Yes
Chloroform	µg/L	14	294	1.0	0.0079	5.1	No
Dieldrin	µg/L	81	294	0.083	0.00101	0.000025	Yes
Diethyl Phthalate	µg/L	14	103	3.1	0.068	590,000	No
Endosulfan Sulfate	µg/L	14	103	0.0090	0.00021	0.0087	No
Ethylbenzene	µg/L	14	103	0.8	0.065	140	No
Malathion	µg/L	14	103	0.22	0.010	0.10	No
Phenol	µg/L	14	103	5.1	0.104	170	No
Toluene	µg/L	14	103	21	2.004	2,100	No
Trichloroethylene	µg/L	14	294	0.20	0.0041	26	No
1,4-Dichlorobenzene	µg/L	14	103	1.4	0.023	660	No
DDT[2]	µg/L	14	294	0.024	0.00019	0.000008	Yes
Total Nitrogen	µg/L	20	NA	120[3]	NA	150.00	No
Ammonia Nitrogen	µg/L	20	NA	6.5[3]	NA	3.5	Yes
Nitrate + Nitrite Nitrogen	µg/L	20	NA	1.85[3]	NA	5.0	No
Total Phosphorus	µg/L	20	NA	8.82[3]	NA	20.00	No

(5) Reasonable Potential Determination.

(a) Constituents with limited data. In some cases, reasonable potential cannot be determined because effluent data are limited. The draft permit requires the Permittee to continue to monitor for these constituents in the effluent using analytical methods that provide the lowest available detection limitations. When additional data become available, further RPAs will be conducted to determine whether to add numeric effluent limitations to this draft permit or to continue monitoring.

Data for the following parameters was not available:

- Dichlorobromomethane
- Carbon Tetrachloride
- 1,2-Dichloroethane
- Bromoform
- Chlorodibromomethane
- delta-BHC
- Acenaphthylene
- Acrylonitrile
- Anthracene
- Benzo(b)Fluoranthene
- Benzo(k)Fluoranthene
- Benzo(a)Pyrene

- Bis(2-Chloroethyl)Ether
- Bis(2-Chloroethoxy)Methane
- Bis(2-Chloroisopropyl)Ether
- Butylbenzyl Phthalate
- Chlorobenzene
- Chrysene
- Dimethyl Phthalate
- 1,2-Diphenylhydrazine
- beta-Endosulfan
- alpha-Endosulfan
- Fluoranthene
- Fluorene
- Hexachlorocyclopentadiene
- Hexachloroethane
- Indeno(1,2,3-cd) Pyrene
- Isophorone
- Methyl Bromide
- Methyl Chloride
- N-Nitrosodimethylamine
- N-Nitrosodi-n-Propylamine
- N-Nitrosodiphenylamine
- Nitrobenzene
- Para Chlorometa Cresol
- Phenanthrene
- Pyrene
- Tetrachloroethylene
- 1,1-Dichloroethane
- 1,1-Dichloroethylene
- 1,1,1-Trichloroethane
- 1,1,2-Trichloroethane
- 1,1,2,2-Tetrachloroethane
- Benzo(ghi)Perylene
- Benzo(a)Anthracene
- 1,2-Dichlorobenzene
- 1,2-Dichloropropane
- 1,2-Trans-Dichloroethylene
- 1,2,4-Trichlorobenzene
- Dibenzo(a,h)Anthracene
- 1,3-Dichlorobenzene
- 2-Chloroethylvinyl Ether
- 2-Chloronaphthalene
- 2-Chlorophenol
- 2-Nitrophenol

- Di-n-Octyl Phthalate
- 2,4-Dichlorophenol
- 2,4-Dimethylphenol
- 2,4-Dinitrotoluene
- 2,4-Dinitrophenol
- 2,4,6-Trichlorophenol
- 2,6-Dinitrotoluene
- 3,3 Dichlorobenzidine
- 4-Bromophenyl Phenyl Ether
- 4-Chlorophenyl Phenyl Ether
- 4-Nitrophenol
- 2-Methyl- 4,6-Dinitrophenol
- PCB-1016
- 2,3,7,8 TCDD
- Naphthalene
- Pentachlorophenol
- Di-n-Butyl Phthalate
- Benzidine
- Vinyl Chloride
- 4,4'-DDE
- Aldrin
- alpha-BHC
- beta-BHC
- gamma-BHC
- Endrin
- Toxaphene
- Heptachlor
- Heptachlor Epoxide
- Methoxychlor
- PCBs
- Parathion
- Demeton
- Guthion
- Hexachlorobenzene
- Hexachlorobutadiene
- Mirex
- 1,3-Dichloropropylene
- Chloroethane
- Chlorophyll a
- Turbidity

(b) Pollutants with No Reasonable Potential. WQBELs are not included in this draft permit for constituents listed in HAR, Chapter 11-54-4.(3) and 11-54-6(b)(3) that do not demonstrate reasonable potential;

however, monitoring for such pollutants is still required in order to collect data for future RPAs. Pollutants with no reasonable potential consist of those identified in Table F-7 or any pollutant not discussed in Parts D.2.c.(5).(a) or D.2.c.(5).(c) of this Fact Sheet.

(c) Pollutants with Reasonable Potential. The RPA indicated that chlordane, dieldrin, DDT, and ammonia nitrogen have reasonable potential to cause, or contribute to an excursion above state water quality standards. Thus, WQBELs have been established in this draft permit at Outfall Serial No. 001 for chlordane, dieldrin, DDT, and ammonia nitrogen.

The RPA results for chlordane and dieldrin are consistent with the results of EPA's TDD in which EPA found the permittee would exceed WQS for chlordane and dieldrin. The RPA results for ammonia nitrogen are also consistent with the findings by EPA in the TDD.

The WQBELs were calculated based on water quality standards contained in HAR, Chapter 11-54 and procedures contained in both STCP and HAR, Chapter 11-54, as discussed in Part D.2.d, below.

d. WQBEL Calculations

Specific pollutant limits may be calculated for both the protection of aquatic life and human health.

(1) WQBELs based on Aquatic Life Standards. The STCP categorizes a discharge from a facility into one of four categories: (1) marine discharges through submerged outfalls; (2) discharges without submerged outfalls; (3) discharges to streams; or (4) high-rate discharges. Once a discharge has been categorized, effluent limitations for pollutants with reasonable potential can be calculated, as described below.

(a) For marine discharges through submerged outfalls, the daily maximum effluent limitation shall be the product of the chronic water quality standard and the minimum dilution factor;

(b) For discharges without submerged outfalls, the daily maximum effluent limitation shall be the acute toxicity standard. More stringent limits based on the chronic standards may be developed using Best Professional Judgment (BPJ);

(c) For discharges to streams, the effluent limitation shall be the most stringent of the acute standard and the product of the chronic standard and dilution; and

(d) For high rate outfalls, the maximum limit for a particular pollutant is equal to the product of the acute standard and the acute dilution factor determined according to Section II.B.4 of the STCP. More stringent limits based on chronic standards may be developed using BPJ.

(2) WQBELs based on Human Health Standards. The STCP specifies that the fish consumption standards are based upon the bioaccumulation of toxics in aquatic organisms followed by consumption by humans. Limits based on the fish consumption standards should be applied as 30-day averages for non-carcinogens and annual averages for carcinogens.

The discharge from this facility is considered a marine discharge through a submerged outfall. Therefore, for pollutants with reasonable potential, the draft permit establishes, on a pollutant by pollutant basis, daily maximum effluent limitations based on saltwater chronic aquatic life standard after considering dilution and average monthly effluent limitations for non-carcinogens or annual average effluent limitations for carcinogens based on the human health standard after considering dilution. WQBELs established in the draft permit are discussed in detail below.

(3) Calculation of Pollutant-Specific WQBELs

As discussed in Part D.2.c.(3) of this Fact Sheet, a minimum initial dilution of 103:1 and an average initial dilution of 294:1 have been established. However, after consideration of the applicable antidegradation regulations in HAR chapter 11-54-1.1, the Director has determined that the Permittee does not need a less stringent dilution to be in compliance with daily maximum effluent limitations in the draft permit, and therefore does not justify allowing for an increased dilution for human health standards for non-carcinogens to 103:1. Therefore, the draft permit retains the dilution of 94:1 for human health standards for non-carcinogens for the calculation of applicable effluent limitations.

The following equations were used to calculate reasonable potential for the pollutants below.

Projected Maximum RWC = MEC x $99\%_{ratio}$ x Dm

Where:

RWC	=	Receiving water concentration
MEC	=	Maximum effluent concentration reported
$99\%_{ratio}$	=	The 99% ratio from Table 3-1 in the TSD or calculated using methods in Section 3.3.2 of the TSD.
Dm	=	Percent Dilution (i.e., 94:1, or 1.06%, for chronic toxicity standards and human health standards

for non-carcinogens, and 294:1, or 0.34% for human health standards for carcinogens)

If the projected maximum receiving water concentration is greater than the applicable water quality standard from HAR, Chapter 11-54, the reasonable potential exists for the pollutant and effluent limitations are established. Pollutants with reasonable potential are discussed below in detail.

(a) Chlordane

i. **Chlordane Water Quality Standards.** The most stringent applicable water quality standard for chlordane is the human health standard of 0.00016 µg/L, as specified in HAR, Chapter 11-54.

ii. **RPA Results.** The Permittee reported 81 data points for chlordane (n = 81) with an average of 0.0649 µg/L and a standard deviation of 0.044 µg/L, resulting in a CV = 0.67. Based on a CV of 0.67 and 81 samples, the 99% multiplier calculated using methods described in section 3.3.2 of the TSD was 1.56. As discussed in Part D.2.c.(3), the facility is granted a dilution of 294:1 for human health carcinogens. Therefore, Dm = 0.34%.

The maximum effluent concentration for chlordane was 0.308 µg/L.

Projected Maximum RWC = MEC x $99\%_{ratio}$ x Dm
= (0.308 µg/L) x 1.56 x 0.0034
= 0.00164 µg/L

HAR, Section 11-54 Water Quality Standard = 0.00016 µg/L

The projected maximum receiving water concentration (0.00164 µg/L) exceeds the most stringent applicable water quality standard for this pollutant (0.00016 µg/L), demonstrating reasonable potential. Therefore, the draft permit establishes effluent limitations for chlordane.

iii. **Chlordane WQBELs.** WQBELs for chlordane are calculated using STCP procedures and are based on the chronic aquatic life water quality standard and human health standard. The draft permit establishes a daily maximum effluent limitation for chlordane of 0.38 µg/L based on the chronic aquatic life water quality standard and a dilution of 94:1, and an annual average effluent limitation of 0.05 µg/L based on the human health standard for carcinogens and a dilution of 294:1.

iv. Feasibility. The maximum effluent concentration reported for chlordane during the term of the previous permit was 0.308 µg/L. Since the maximum effluent concentration is less than the proposed maximum daily effluent limitation of 0.38 µg/L, the DOH has determined that the facility will be able to comply with proposed maximum daily chlordane effluent limitations.

The maximum annual average concentration reported for chlordane during the term of the previous permit was 0.077 µg/L. Since the maximum annual average effluent concentration is greater than the proposed annual average effluent limitation of 0.05 µg/L, the DOH has determined that the facility may not be able to immediately comply with proposed annual average effluent limitation.

v. Anti-backsliding. The previous permit contained a more stringent annual average effluent limitation for chlordane. The annual average effluent limitation for chlordane was based on the human health aquatic life standard of 0.000016 mg/L, contained in HAR, Section 11-54-4(b)(3) at the time the permit was adopted. However, as explained by the DOH in *Rationale for Proposed Revisions to Hawaii Administrative Rules Title 11 Department of Health Chapter 54 Water Quality Standards*, the human health water quality standard was stated incorrectly in HAR, Chapter11-54. The value was stated as 0.000016 µg/L, instead of 0.00016 µg/L. The DOH has since amended the water quality standard. The new standard of 0.00016 µg/L was adopted by the DOH on June 15, 2009, and approved by the EPA on March 19, 2010. The draft permit establishes a new annual average effluent limitation for chlordane of 0.05 µg/L based on the new water quality standard of 0.00016 µg/L and a dilution of 294:1. This is less stringent than the previous permit which established an effluent limitation for chlordane of 0.0076 µg/L based on the incorrect standard and a less stringent dilution of 476:1. Anti-backsliding regulations at 40 CFR 122.44(l)(i) allow for effluent limitations in a reissued permit to be less stringent than the previous permit if information is available at the time of permit reissuance that wasn't available at the time the previous permit was adopted. The new effluent limitation is based on the finding that the previous WQS was incorrect and a corrected WQS has been adopted in HAR, Chapter 11-54. In addition, as discussed in Part D.2.c.(3), dilution values have been calculated by EPA using recent ambient conditions and modern modeling software. The dilution study showed that the receiving water has an available average dilution of 294:1.

Based on an annual average effluent limitation of 0.05 µg/L, and a new design flow of 90 MGD, the Permittee will have a mass-based effluent limitation of 0.037 lbs/day. Based on effluent data from October 2006 through June 2011, the Permittee's running annual average loading for chlordane is 0.036 lbs/day, with a maximum annual average loading of 0.052 lbs/day. Thus, an increase in the average annual effluent limitation for chlordane is not expected to result in an increase in loading of the pollutant discharged to the receiving water. The DOH has determined that the impact of the new effluent limitation will be insignificant on the receiving water and the level of water quality necessary to protect the existing uses will be maintained and protected. Because the receiving water is not impaired for chlordane, and the revised limitation is not expected to result in an increase of loading of chlordane to the receiving water, degradation of the receiving water is not expected, and the revised limitation is consistent with the requirements of Section 303(d)(4)(B) of the CWA.

Establishing a less stringent annual average effluent limitation based on a new dilution and an amended water quality standard for chlordane given the circumstances is consistent with State and federal anti-backsliding regulations.

(b) Dieldrin

i. **Dieldrin Water Quality Standards.** The most stringent applicable water quality standard for dieldrin is the human health standard of 0.000025 µg/L, as specified in HAR, Chapter 11-54.

ii. **RPA Results.** The Permittee reported 81 data points for dieldrin (n = 81) with an average of 0.0245 µg/L and a standard deviation of 0.021 µg/L, resulting in a CV = 0.87. Based on a CV of 0.87 and 81 samples, the 99% multiplier calculated using methods described in section 3.3.2 of the TSD was 1.73. As discussed in Part D.2.c.(3), the facility is granted a dilution of 294:1 for human health carcinogens. Therefore, Dm = 0.34%.

The maximum effluent concentration for dieldrin was 0.172 µg/L.

Projected Maximum RWC = MEC x $99\%_{ratio}$ x Dm
= (0.172 µg/L) x 1.73 x 0.0034
= 0.00101 µg/L

HAR, Section 11-54 Water Quality Standard = 0.000025 µg/L

The projected maximum receiving water concentration (0.00101 µg/L) exceeds the most stringent applicable water quality standard for this pollutant (0.000025 µg/L), demonstrating reasonable potential. Therefore, the draft permit establishes effluent limitations for dieldrin.

iii. **Dieldrin WQBELs.** WQBELs for dieldrin were calculated using STCP procedures and are based on the chronic aquatic life water quality standard and human health standard. The draft permit establishes a daily maximum effluent limitation for dieldrin of 0.18 µg/L based on the chronic aquatic life water quality standard and a dilution of 94:1, and an annual average effluent limitation of 0.0074 µg/L based on the human health standard for carcinogens and a dilution of 294:1.

iv. **Feasibility.** The maximum effluent concentration reported for dieldrin during the term of the previous permit was 0.172 µg/L. Since the maximum effluent concentration is less than the proposed maximum daily effluent limitation of 0.18 µg/L, the DOH has determined that the facility will be able to comply with proposed maximum daily dieldrin effluent limitations.

The maximum annual average concentration reported for dieldrin during the term of the previous permit was 0.033 µg/L. Since the maximum annual average effluent concentration is greater than the proposed annual average effluent limitation of 0.0074 µg/L, the DOH has determined that the facility may not be able to immediately comply with proposed annual average effluent limitation. The maximum annual average effluent limitation for dieldrin may be attainable after the upgrades required by the Consent Decree have been initiated.

v. **Anti-backsliding.** Anti-backsliding regulations are satisfied because the effluent limitations established in this permit are at least as stringent as the effluent limitations established in the previous permit.

(c) DDT

i. **DDT Water Quality Standards.** The most stringent applicable water quality standard for DDT is the human health standard of 0.000008 µg/L, as specified in HAR, Chapter 11-54.

ii. **RPA Results.** The Permittee reported nine data points for DDT (n = 14), resulting in a CV = 0.46. Based on a CV of 0.46 and 14 samples, the 99% multiplier was calculated as 2.14. As

discussed in Part D.2.c.(3), the facility is granted a dilution of 294:1 for human health carcinogens. Therefore, Dm = 0.34%.

The maximum effluent concentration for DDT was 0.027 µg/L.

Projected Maximum RWC = MEC x $99\%_{ratio}$ x Dm
= (0.027 µg/L) x 2.14 x 0.0034
= 0.00019 µg/L

HAR, 11-54 Water Quality Standard = 0.000008 µg/L

The projected maximum receiving water concentration (0.00019 µg/L) exceeds the most stringent applicable water quality standard for this pollutant (0.000008 µg/L), demonstrating reasonable potential. Therefore, the draft permit establishes effluent limitations for DDT.

iii. DDT WQBELs. WQBELs for DDT were calculated using STCP procedures and are based on the chronic aquatic life water quality standard and human health standard. The draft permit establishes a daily maximum effluent limitation for DDT of 0.094 µg/L based on the chronic aquatic life water quality standard and a dilution of 94:1, and an annual average effluent limitation of 0.0024 µg/L based on the human health standard for carcinogens and a dilution of 294:1.

iv. Feasibility. The maximum effluent concentration reported for DDT during the term of the previous permit was 0.027 µg/L. Since the maximum effluent concentration is less than the proposed maximum daily effluent limitation of 0.094 µg/L, the DOH has determined that the facility will be able to comply with proposed maximum daily DDT effluent limitations. The maximum annual average concentration reported for DDT during the term of the previous permit was 0.018 µg/L. Since the maximum annual average effluent concentration is greater than the proposed annual average effluent limitation of 0.0024 µg/L, the DOH has determined that the facility may not be able to comply with proposed annual average effluent limitations.

v. Anti-backsliding. Anti-backsliding requirements are satisfied because the previous permit did not contain effluent limitations for DDT at Outfall Serial No. 001.

e. Nutrients

i. Ammonia Nitrogen

HAR, Chapter 11-54-6, establishes the following WQS for ammonia nitrogen:

Parameter	Geometric Mean	Value not to exceed more than 10% of the time	Value not to exceed more than 2% of the time
Ammonia Nitrogen (µg/L)	3.50	8.50	15.00

As demonstrated in Table F-7 of this Fact Sheet, reasonable potential to exceed applicable WQS for ammonia nitrogen has been determined. This finding is consistent with EPA's TDD, which found, based on receiving water data, that, "[the Permittee] has not demonstrated that it can consistently attain State water quality standards for ammonia nitrogen."

Receiving water data from February 18, 2009 through October 23, 2013 indicate that assimilative capacity is available for ammonia nitrogen in the receiving water. Assimilative capacity was determined as specified below:

i. Review EPA's 303(d) list to determine if the water body is impaired for ammonia nitrogen.

   The water body is not listed in EPA's 303(d) list for ammonia nitrogen.

ii. Identify nearby control stations to determine the "decision unit" for analysis.

   Control Stations D1, D4, E1, and E4 have been identified as the applicable control stations for evaluating assimilative capacity and constitute the decision unit for the analysis.

iii. Data from all stations (including surface, middle, and bottom) are aggregated together to represent the decision unit and generate annual geomeans. To ensure adequate assimilative capacity, the highest annual geomean for the decision unit shall not exceed 90 percent of the applicable WQS.

   The resulting geomeans were:

Year	Result (µg/L)
2009	1.42
2010	1.6
2011	2.01
2012	2.25
2013	2.53

The highest annual geomean for the decision unit of 2.53 µg/L is less than 90 percent of the applicable WQS (3.15 µg/L). Assimilative capacity appears to be present in the receiving water.

iv. Consider other available information if available, including studies, reports, and receiving water data trends.

Information is not currently known that would result in the removal of assimilative capacity for ammonia nitrogen. However, as presented in Step iii. Above, receiving water data does indicate a trend of increasing concentration within the receiving water. The Permittee shall be required to conduct a ZOM confirmation study to verify that assimilative capacity within the receiving water exists and that the observed trend of increasing ammonia nitrogen concentrations is not due to a lack of assimilative capacity.

Because dilution at the edge of the ZOM is not currently known, end-of-pipe water quality-based effluent limitations cannot be determined. However, WQS exceedances at the edge of the ZOM occurred over the previous permit term, indicating that current effluent concentrations have the potential to exceed the available assimilative capacity for ammonia nitrogen. In the absence of a known dilution factor at the boundary of the ZOM, and in addition to applicable receiving water limitations and requirements to evaluate available assimilative capacity and dilution at the edge of the ZOM, this permit establishes performance-based effluent limitations for ammonia nitrogen to minimize the potential for WQS exceedances within the receiving water.

Effluent data for ammonia nitrogen is limited to three monitoring events, with an MEC of 15,400 µg/L reported with the NPDES permit renewal application. When there are less than 10 sampling data points available, the TSD recommends a coefficient of variation of 0.6 be utilized as representative of wastewater effluent sampling. The multipliers contained in Table 5-2 of the TSD are used to determine a maximum daily limitation based on a long-term average objective. In this case, the long-term average objective is to maintain, at a minimum, the current plant performance level. Because there are less than 10 sampling points, the interim daily maximum effluent limitation has been based on 3.11 times the MEC.

A performance-based single sample effluent limitation of 47,894 µg/L has been established based on the maximum effluent concentration observed over the previous permit term. Further, receiving water limitations based on the standards established in HAR, Chapter 11-54-6(b)(3) have been established in this permit.

Anti-backsliding regulations are satisfied because the effluent limitations were not established in the previous permit for ammonia nitrogen, thus these limitations are at least as stringent as the previous permit.

f. pH

The Permittee was previously granted a ZOM for pH to comply with water quality standards for open coastal waters in HAR, Section 11-54-6(b)(3). Receiving water data from March 2006 through April 2013 indicate compliance with the water quality objectives for pH at the edge of the ZOM. The technology-based effluent limitations of between 6.0 to 9.0 at all times appears to be protective of water quality outside the ZOM and has been carried over.

g. Enterococcus

HAR, Section 11-54-8(b) establishes water quality objectives for marine recreational waters within 300 meters (1,000 feet) of shore. As discussed in Part E.3.a of this Fact Sheet, the draft permit establishes receiving water limitations for marine recreational waters within 300 meters (1,000 feet) from shore based on State regulations contained in HAR, Chapter 11-54. Federal regulations at 40 CFR Section 131.41(c)(2) establish water quality standards for bacteria in marine waters beyond 300 meters from shore, based on CWA Section 304(a). 40 CFR Section 131.42(e)(2) specifies that the regulations established in 40 CFR Section 131.41(c)(2) applies to waters of Hawaii beyond 300 meters of the shoreline.

The discharge to the receiving water occurs approximately greater than 1.7 miles from shore (~9,100 feet) and its use is not consistent with that at a bathing beach or used frequently during the recreation season. Immediate contact or use of the receiving water in the vicinity of the discharge is rarely expected to occur. The receiving water use is consistent with “infrequent use coastal recreation waters”, as defined at 40 CFR 131.41(a)(5).

The applicable single sample maximum criteria for marine waters defined as infrequent use coastal recreation waters is 501 CFU/100 mL. This criteria is consistent with the applicable single sample maximum criteria identified in EPA’s TDD.

The draft permit establishes the following end-of-pipe effluent limitations and monitoring requirements for enterococcus at Outfall Serial No. 001 based on 40 CFR 131.41(c)(2). Although the human contact with the receiving water may be infrequent, human contact within the zone of mixing may occur, thus for the protection of human health due to the potential for acute illness from pathogens, the minimum initial dilution of 103:1 was used to evaluate reasonable potential and calculate applicable WQBELs for enterococcus.

Because this is a new effluent limitation, the dilution calculated by the EPA was used, rather than the one used in the previous permit. Therefore antibacksliding requirements are satisfied.

(1) Due to the potential for human contact within the receiving water, a geometric mean of 3,605 CFU per 100 milliliters based on the geometric mean of 35 CFU per 100 milliliters and a minimum initial dilution of 103:1. Based on effluent data from January 2007 through December 2013, the WQS applied as a monthly geometric mean represents approximately the 12th percentile of the Permittee's monthly geometric means, and was exceeded 71 times, indicating that the Permittee has reasonable potential to cause or contribute to an exceedance of water quality. Thus, the monthly geometric mean of 3,605 CFU per 100 milliliters has been applied as an effluent limitation in the proposed permit.

(2) Considering the applicable single sample maximum for coastal recreation waters of 501 CFU per 100 milliliters and a minimum dilution of 103:1, the resulting WQBEL is 51,603 CFU per 100 milliliters. Based on effluent data from January 2007 through December 2013, the WQS represents the 80th percentile of the Permittee's effluent data, and was exceeded 16 times, indicating that the Permittee has reasonable potential to cause or contribute to an exceedance of water quality.

The previous permit required the Permittee to design, construct, and operate an effluent disinfection facility which achieves compliance with a maximum daily discharge limitation of 18,000 CFU per 100 milliliters. Further, the previous permit established a daily maximum effluent limitation of 18,000 CFU per 100 milliliters for Enterococci, with compliance determined based on a daily maximum geometric mean. The enterococci effluent limitation of 18,000 CFU per 100 milliliters was based on average dilution assumptions from 1998 and a water quality criteria of 7 CFU per 100 milliliters (revised on June 15, 2009 to 35 CFU per 100 milliliters, as discussed in Part E.3.1.(3)(a) of this Fact Sheet) . Consistent with the permit requirement, the Permittee has designed and installed the disinfection system.

Consistent with HAR, Chapter 11-54-1.1.(b), where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation, in and on the water, that quality shall be maintained and protected unless a lowering of water quality is necessary to accommodate important economic or social development. Because the Permittee has designed and constructed the facilities necessary to achieve compliance with the previous effluent limitation, and has not demonstrated further degradation of water quality is necessary to accommodate important economic or social development, the maximum

daily geometric mean effluent limitation of 18,000 per 100 milliliters has been carried over.

Based on effluent data from October 2006 through December 2013, the highest monthly geometric mean of 2,460,035 CFU/100 mL was during the month of October 2006. However the ultraviolet disinfection system did not come on-line until November 2006, at which point the highest monthly geometric mean was 16,431 CFU/100 mL. It does not appear the Permittee can immediately comply with the monthly geometric mean effluent limitation for enterococcus. Consistent with HAR, Section 11-55-21, this permit establishes a compliance schedule for the Permittee to comply with the final monthly geometric mean effluent limitation for enterococcus by June 30, 2024. Because the daily maximum effluent limitation for enterococcus is no more stringent than the limitation established in the previous permit, a compliance schedule for the daily maximum effluent limitation may not be considered.

The schedule of compliance is being proposed for a parameter that was not limited at the proposed level in the previous permit and the existing discharge is not expected to immediately comply with the proposed limitation. Final compliance will ultimately require the implementation of an unidentified treatment technology. Sufficient time to select the preliminary preferred alternative, conduct pilot testing, engineering design, permitting, construction, and optimization and testing is not available prior to the effective date of this permit. Thus, a compliance schedule is necessary.

The Permittee is currently subject to the 2010 Consent Decree, which requires the Permittee to upgrade the facility to meet secondary treatment standards for BOD5 and TSS by December 31, 2035. The planning and construction of the facility upgrades necessary to comply with the final monthly geometric mean effluent limitation partly coincides with the 2010 Consent Decree, however, since disinfection facilities are already currently in place at the facility, the Permittee may only need to optimize or expand the capacity of these facilities in order to comply with the final monthly geometric mean WQBEL. Thus full compliance with the final effluent limitations is required by June 30, 2024.

HAR, Section 11-55-21(b) states, “When a schedule specifies compliance longer than one year after permit issuance, the schedule of compliance shall specify interim requirements and the dates for their achievement and in no event shall more than one year elapse between interim dates. If the time necessary for completion of interim requirement (such as the construction of a treatment facility) exceeds one year and is not readily divided into stages for completion, the schedule shall specify interim dates for the submission of reports of progress towards completion of the interim requirements.”

The compliance schedule for enterococcus allows for the funding, evaluation, design, and the execution of the construction contract to mirror the 2010 Consent Decree, as the acquisition of funding and contract execution can be challenging with government entities. However, once the contract is executed, since the current disinfection facility may only need to be upgraded, the full length of the Consent Decree should not be necessary.

During the compliance schedule, the Permittee is required to maintain current treatment capability. An interim effluent limitation for enterococcus has been established until the final effluent limitation becomes effective. The interim effluent limitation has been developed based on observed effluent data over the recent permit-term. The highest observed monthly geometric mean between October 2006 through December 2013 was 2,460,035 CFU/100 mL. However, this observed concentration is approximately seven standard deviations above the mean, much higher than any of the other observed geometric means and was prior to the initiation of the ultraviolet disinfection system in November 2006. The highest observed geometric mean does not appear representative of current treatment capabilities. The second highest geometric mean between October 2006 through December 2013 was 16,431 CFU/100 mL and falls within three standard deviations of the observed mean. Thus, a monthly geometric mean effluent limitation of 16,431 CFU/100 mL has been established in this permit based on current facility treatment capabilities.

As previously discussed, effluent data indicate that the Permittee cannot immediately comply with the proposed monthly geometric mean effluent limitation for enterococcus, anticipated upgrades necessary to comply with the final effluent limitations may not be implemented prior to the effective date of the permit, a compliance schedule that represents the minimum time period for compliance has been established, and an interim effluent limitation has been established that require the Permittee to maintain current treatment capabilities. The proposed schedule of compliance is in accordance with HAR, Section 11-55-21(b) and 40 CFR 122.47.

Anti-backsliding regulations are satisfied because monthly geometric mean effluent limitations were not established in the previous permit for enterococcus, thus these limitations are at least as stringent as the previous permit.

h. Whole Effluent Toxicity (WET)

WET limitations protect receiving water quality from the aggregated toxic effect of a mixture of pollutants in an effluent. WET tests measure the degree of response of exposed aquatic test organisms to an effluent or receiving water. The WET approach allows for protection of the narrative criterion specified in HAR, Chapter 11-54-4(b)(2) while implementing Hawaii's numeric

WQS for toxicity. There are two types of WET tests – acute and chronic. An acute toxicity test is conducted over a short period of time and measures mortality. A chronic toxicity test is generally conducted over a longer period of time and may measure mortality, reproduction, or growth.

The previous permit established a chronic WET effluent limitation at Outfall Serial No. 001 for *Ceriodaphnia dubia* and additional monitoring for *Tripneustes gratilla.*

Whole effluent toxicity data for the time period between October 2006 and December 2013 using the test species *C. dubia* did not result in an exceedance of the chronic toxicity effluent limitation, however monitoring results for *T. gratilla* indicates that the Permittee has reasonable potential to exceeded the effluent limitation for chronic toxicity of 94 TU_c established in the previous Permit for Outfall Serial No. 001, with effluent results as high as >1428.6 TUc, during 79 of the 82 months during the time period between October 2006 and December 2013 (results were not submitted for some months).

A chronic WET effluent limitation has been established at Outfall Serial No. 001. For improved WET analysis, DOH has begun implementing EPA's Test of Significant Toxicity Method (TST) for WET effluent limitations within the State. As such, the chronic WET effluent limitation at Outfall Serial No. 001 has been revised to be consistent with the TST method using *T. gratilla*.

T. gratilla is a native species to Hawaii, and as observed in historic effluent data, *T. gratilla* is more sensitive to potential toxic pollutants within the Permittee's effluent than *C. dubia*. The use of *T. gratilla* is representative of toxic impacts on local species.

Test procedures for measuring toxicity to marine organisms of the Pacific Ocean, including *T. gratilla*, are not provided at 40 CFR 136. Consistent with the Preamble to EPA's 2002 Final WET Rule, permit writers may include (under 40 CFR 122.41(j)(4) and 122.44(i)(iv)) requirements for the use of test procedures that are not approved at 40 CFR Part 136 on a permit-by-permit basis. The use of alternative methods for West coast facilities in Hawaii is further supported under 40 CFR 122.21(j)(5)(viii), which states, "West coast facilities in…, Hawaii,… are exempted from 40 CFR [P]art 136 chronic methods and must use alternative guidance as directed by the permitting authority."

EPA has issued applicable guidance for conducting chronic toxicity tests using T. gratilla in Hawaiian Collector Urchin, Tripneustes gratilla (Hawa'e) Fertilization Test Method (Adapted by Amy Wagner, EPA Region 9 Laboratory, Richmond, CA from a method developed by George Morrison, EPA, ORD Narragansett, RI and Diane Nacci, Science Applications International Corporation, ORD Narragansett, RI) (EPA/600/R-12/022).

As previously discussed, reasonable potential for WET has been determined for Outfall Serial No. 001 and an effluent limitation must be established in accordance with 40 CFR 122.44(d)(1). Further, a WET effluent limitation and monitoring are necessary to ensure compliance with applicable WQS in HAR, Chapter 11-54-4(b)(2).

The proposed WET limitation and monitoring requirements are incorporated into the draft permit in accordance with the EPA national policy on water quality-based permit limitations for toxic pollutants issued on March 9, 1984 (49 FR 9016), HAR, Section 11-54-4(b)(2)(B), and EPA's National Pollutant Discharge Elimination System Test of Significant Toxicity Implementation Document (EPA 833-R-10-003, 2010).

Consistent with HAR, Chapter 11-54-4(b)(2)(B), this Permit establishes a chronic toxicity effluent limitation based on the TST hypothesis testing approach. The TST approach was designed to statistically compare a test species response to the in-stream waste concentration (IWC) and a control.

For continuous discharges through submerged outfalls, HAR, Section 11-54-4(b)(4)(A) requires the no observed effect concentration (NOEC), expressed as a percent of effluent concentration, to not be less than 100 divided by the minimum dilution. Thus, EPA's minimum dilution of 103:1 is most appropriate for establishing a critical dilution factor.

The use of EPA's minimum dilution of 103:1 for determining an applicable IWC is greater than the previous initial minimum dilution used to calculate the applicable chronic toxicity effluent limitation of 94:1. The use of 103:1 dilution is based on the availability of new information contained within EPA's 301(h) waiver denial, and is consistent with Section 402(o)(2) of the CWA's backsliding requirements. Further, the Permittee's historic effluent data indicates frequent occurrences of elevated levels of toxicity (routinely exceeding 357 TU_c) with *T. gratilla*, justifying the need for greater dilution. Because the Permittee has historically exceeded 357 TU_c using *T. gratilla*, an effluent limitation based on an IWC of 103:1 would not result in any additional pollutant loading of toxic substances greater than is currently being discharged. Thus, the use of an IWC based on a dilution of 103:1 is not expected to result in the degradation of the receiving water. Further, the receiving water is not impaired for chronic toxicity. The revised limitation is consistent with the anti-degradation requirements established in Section 303(d)(4)(B) of the CWA and HAR, Section 11-54-1.1.

The following equation is used to calculate the IWC where dilution is granted (Outfall Serial No. 001):

IWC = 100/critical dilution factor

= 100/103

= 0.97%

For any one chronic toxicity test, the chronic WET permit limit that must be met is rejection of the null hypothesis (Ho):

IWC (percent effluent) mean response ≤ 0.75 × Control mean response.

A test result that rejects this null hypothesis is reported as "Pass". A test result that does not reject this null hypothesis is reported as "Fail"

The acute and chronic biological effect levels (effect levels of 20% and 25%, respectively, or b values of 0.80 and 0.75, respectively) incorporated into the TST define EPA's unacceptable risks to aquatic organisms and substantially decrease the uncertainties associated with the results obtained from EPA's traditionally used statistical endpoints for WET. Furthermore, the TST reduces the need for multiple test concentrations which, in turn, reduces laboratory costs for Permittees while improving data interpretation. A significant improvement offered by the TST approach over traditional hypothesis testing is the inclusion of an acceptable false negative rate. While calculating a range of percent minimum significant differences (PMSDs) provides an indirect measure of power for the traditional hypothesis testing approach, setting appropriate levels for β and α using the TST approach establishes explicit test power and provides motivation to decrease within test variability which significantly reduces the risk of under reporting toxic events (USEPA 20101).

Taken together, these refinements simplify toxicity analyses, provide Permittees with the positive incentive to generate high quality data, and afford effective protection to aquatic life.

A WET effluent limitation based on the TST hypothesis testing approach is protective of the WQS for toxicity contained in HAR, Section 11-54-4(b)(4)(B) and is not considered to be less stringent. Use of the TST approach is consistent with the requirements of State and federal anti-backsliding regulations.

i. Summary of Final Effluent Limitations

In addition to the effluent limitations specified above, HAR, Section 11-55-20 requires that daily quantitative limitations by weight be established where possible. Thus, in addition to concentration based-effluent limitations, mass-based effluent limitations (in pounds per day) have been established where applicable based on the following formula:

lbs/day = 8.34 * concentration (mg/L) * flow (MGD)

1 U.S. Environmental Protection Agency. 2002a. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms (5th Edition). EPA 821-R-02-012. Washington, DC: Office of Water.

40 CFR 122.45(b)(1) requires that mass-based effluent limitations for POTWs be based on design flow. The previous permit established mass based effluent limitations on the facility design flow of 82 MGD at the time the previous permit was adopted. However, Part A.2.f of the previous permit required the Permittee to construct additional primary treatment facilities, including pretreatment facilities, to expand the treatment plant capacity from 82 MGD to 90 MGD. Because the increase in flow was authorized by the previous permit, it is not subject to additional anti-degradation analysis during this permit renewal.

The following table lists final effluent limitations contained in the draft permit and compares them to effluent limitations contained in the previous permit.

Table F-8. Summary of Final Effluent Limitations – BOD and TSS

Parameter	Units	Effluent Limitations Contained in the Previous Permit			Proposed Effluent Limitations		
		Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily
Biochemical Oxygen Demand (BOD) (5-day @ 20 Deg. C)	mg/L	116[1]	160[1]	--	30	45	--
	lbs/day	79,330[2]	109,421[2]	--	22,518[3]	33,777[3]	--
	% Removal	As a monthly average, not less than 30 percent removal efficiency from the influent stream.			The average monthly percent removal shall not be less than 85 percent.		
Total Suspended Solids (TSS)	mg/L	69[1]	104[1]	--	30	45	--
	lbs/day	47,187[2]	71,124[2]	--	22,518[3]	33,777[3]	--
	% Removal	As a monthly average, not less than 60 percent removal efficiency from the influent stream.			The average monthly percent removal shall not be less than 85 percent.		

[1] Effluent limitations contained in the previous permit and effective through December 2010. These effluent limitations were replaced with interim effluent limitations in the December 2010 United States of America v. City and County of Honolulu Consent Decree (2010 Consent Decree).
[2] Based on a design flow of 82 MGD.
[3] Based on a design flow of 90 MGD.

Table F-9. Summary of Final Effluent Limitations – All Other Pollutants

Parameter	Units	Effluent Limitations Contained in the Previous Permit			Proposed Effluent Limitations		
		Average Annual	Average Monthly	Average Daily	Average Annual	Average Monthly	Maximum Daily
Enterococci	CFU/100 ml	--	--	18,000[1]	--	3,605[2]	18,000[3]
pH	s.u.	Not less than 6.0 and not greater than 9.0			Not less than 6.0 and not greater than 9.0		
Chronic Toxicity – *Ceriodaphnia Dubia*	TUc	--	--	94	--	--	--
Chronic Toxicity – *Tripneustes Gratilla*	TUc	--	--	[4]	--	--	Pass[5]
Ammonia Nitrogen	µg/L	--	--	--	--	--	47,894
	lbs/day	--	--	--	--	--	35,949
Chlordane	µg/L	0.0076	--	0.38	0.05	--	0.38
	lbs/day	0.0052	--	0.26	0.037	--	0.28

Parameter	Units	Effluent Limitations Contained in the Previous Permit			Proposed Effluent Limitations		
		Average Annual	Average Monthly	Average Daily	Average Annual	Average Monthly	Maximum Daily
Dieldrin	µg/L	0.012	--	0.18	0.0074	--	0.18
	lbs/day	0.0082	--	0.12	0.0056	--	0.14
DDT[6]	µg/L	--	--	--	0.0024	--	0.094
	lbs/day	--	--	--	0.0018	--	0.071
Total Residual Chlorine	µg/L	--	--	64	--	--	--[7]

[1] Effluent limitation was a daily maximum effluent limitation.
[2] Effluent limitation expressed as a monthly geometric mean. An interim monthly geometric mean effluent limitation of 16,431 CFU/100 mL is effective on the effective date of this permit, through December 31, 2038. If compliance with the final effluent limitation is possible prior to this date, the Permittee shall comply with the final effluent limitation as soon as possible.
[3] Effluent limitation expressed as maximum daily geometric mean.
[4] The chronic toxicity discharge limitation of 94 TUc listed in Part A.1 of the previous permit does not apply to monitoring results for toxicity tests using *Trypneustes gratilla*.
[5] "Pass", as described in section D.2.h of this Fact Sheet.
[6] DDT shall mean the sum of 4,4'-DDT, 2,4'-DDT, 4,4'-DDE, 2,4-'DDE, 4,4'-DDD, and 2,4'-DDD.
[7] The previous permit required the Permittee to monitor total residual chlorine upon initiation of chlorination if the Permittee determined that the appropriate disinfection technology to achieve disinfection is chlorination. In November 2006, the Permittee started using UV disinfection; therefore, this limit is not applicable.

j. Satisfaction of Anti-Backsliding Requirements

The CWA specifies that a revised permit may not include effluent limitations that are less stringent than the previous permit unless a less stringent limitation is justified based on exceptions to the anti-backsliding provisions contained in CWA Sections 402(o) or 303(d)(4), or, where applicable, 40 CFR 122.44(l).

Federal anti-backsliding regulations at 40 CFR 122.44(l)(i) allows for effluent limitations in a reissued permit to be less stringent if information is available which was not available at the time of the permit issuance and which have justified the application of a less stringent effluent limitation. The draft permit establishes a less stringent annual average effluent limitation for chlordane based on the results of a new dilution study and the finding that the WQS used to develop the previous limitation was an error. As discussed in Part D.2.d.(3) of this Fact Sheet, these new effluent limitations are consistent with State and federal anti-backsliding regulations because the effluent limitations are based on new information that was not available during the drafting of the previous permit.

The draft permit establishes less stringent daily maximum mass-based effluent limitations for chlordane and dieldrin based on the previously authorized flow increase from 82 MGD to 90 MGD. The increase in design capacity represents a substantial alteration to the permitted facility that is directly related to the application of mass-based effluent limitations, as

allowed by Section 402(o)(2) of the CWA. Further, consistent with Section 303(d)(4), the receiving water is not known to be impaired for these pollutants, and the increase in flow has previously been approved for antidegradation by the previous permit. Thus, consistent with Sections 402(o)(2) and 303(d)(4) of the CWA, this permit authorizes the increase of mass-based daily maximum effluent limitations for chlordane and dieldrin.

Effluent limitations and requirements for all other pollutants are at least as stringent as those in the previous permit and are consistent with State and federal anti-backsliding regulations.

k. Satisfaction of Antidegradation Policy Requirements

The DOH established the State anti-degradation policy in HAR, Section 11-54-1.1, which incorporates the federal anti-degradation policy at 40 CFR 131.12. HAR, Section 11-54-1.1 requires that the existing quality of waters be maintained unless degradation is justified based on specific findings demonstrating that allowing lower water quality is necessary to accommodate economic or social development in the area in which the waters are located. The draft permit establishes mass-based effluent limitations based on a flow of 90 MGD, an increase from 82 MGD in the previous permit. The increase in flow was authorized by the previous permit by requiring the Permittee to expand the treatment plant capacity from 82 MGD to 90 MGD, improve plant hydraulic capacity, and increase solids handling capacity. The antidegradation analysis is cited in the previous fact sheet for the permit, issued jointly by the EPA and DOH, and was subject to public participation requirements. Therefore the completion of an additional antidegradation analysis is not necessary.

The permitted discharge is consistent with antidegradation provisions of 40 CFR 131.12 and HAR, Section 11-54-1.1. The impact on existing water quality will be insignificant and the level of water quality necessary to protect the existing uses will be maintained and protected.

E. Rationale for Receiving Water and Zone of Mixing Requirements

1. Summary of ZOM Water Quality Standards and Monitoring Data

The following are effluent quality monitoring results for HAR, Chapter 11-54, specific water quality criteria parameters that were provided in the ZOM Application on December 21, 2010, and applicable ZOM water quality criteria from 11-54-6(b)(3).

Table F-10. ZOM Monitoring Data

Parameter	Units	Applicable Water Quality Standard	Maximum Reported Concentration[1]
Total Nitrogen	µg/L	150[2]	23,302
Ammonia Nitrogen	µg/L	3.5[2]	11,900
Nitrate + Nitrite	µg/L	5.0[2]	110
Orthophosphate Phosphorus	µg/L	--	3,440
Total Phosphorus	µg/L	20[2]	2,900
Chlorophyll a	µg/L	0.30[2]	0.923
Turbidity	NTU	0.50[2]	82.5
TSS	mg/L	--	38.7
pH	s.u.	[3]	7.0
Dissolved Oxygen	mg/L	[4]	2.38
Temperature	°C	[5]	26.5
Salinity	ppm	[6]	7,200

[1] Source: ZOM Application dated December 21, 2010
[2] Water quality standard expressed as a geometric mean.
[3] pH shall not deviate more than 0.5 units from a value of 8.1, except at coastal locations where and when freshwater from stream, stormdrain, or groundwater discharge may depress the pH to a minimum level of 7.0.
[4] Dissolved oxygen shall not be less than 75 percent saturation.
[5] Temperature shall not vary more than 1° Celsius from ambient conditions.
[6] Salinity shall not vary more than 10 percent from natural or seasonal changes considering hydrologic input and oceanographic factors.

2. Existing Receiving Water Limitations and Monitoring Data

a. Shoreline Stations

The following are a summary of the geometric mean values calculated from each shoreline monitoring location, reported in the monthly DMRs from January 2009 to December 2013.

Table F-11. Shoreline Monitoring Stations

Station	Geometric Mean[1] Enterococcus CFU/100 mL
S1	7.05
S2	2.22
S5	7.16
S7	4.26
S8	10.94
Water Quality Standard	35

[1] Source: Monthly DMR's submitted by the Permittee from January 2009 to December 2013.

b. Nearshore Stations

The following are a summary of the geometric mean values calculated from each near shore monitoring location, reported in the monthly and quarterly DMRs from 2009 through 2013.

Table F-12. Nearshore Monitoring Stations

Station	Highest Annual Geometric Mean[1]						
	Enterococcus	Nitrate + Nitrite Nitrogen[2]	Ammonia Nitrogen[2]	Total Nitrogen[2]	Total Phosphorus[2]	Turbidity[2]	Chlorophyll a[2]
	CFU/100 mL	µg/L	µg/L	µg/L	µg/L	NTU	µg/L
R1	1.83	--	--	123	14.6	--	1.11
R2	1.52	--	--	121	12.0	--	0.91
R3	1.97	--	--	115	10.8	--	0.71
C1	1.11	3.42	2.67	102	8.9	0.38	0.25
C2	1.25	3.42	3.08	102	8.8	0.35	0.29
C3	1.25	1.82	3.47	98	8.4	0.25	0.29
C4	1.23	1.41	2.31	98	8.5	0.29	0.29
C5	1.26	2.01	2.50	99	8.4	0.35	0.31
C6	1.14	--	--	--	--	--	--
Water Quality Standard	35	5.0	3.5	150	20	0.50	0.30

[1] Source: Monthly and Quarterly DMR's submitted by the Permittee from 2009 through 2013.
[2] Reported geometric mean is the maximum geometric mean from the top, middle, and bottom sampling points at each station.

c. Offshore Stations

The following are a summary of the geometric mean values calculated from each offshore monitoring location, reported in the monthly and quarterly DMRs from 2009 through 2013.

Table F-13. Offshore Monitoring Stations

Station	Highest Annual Geometric Mean[1]						
	Enterococcus	Nitrate + Nitrite Nitrogen[2]	Ammonia Nitrogen[2]	Total Nitrogen[2]	Total Phosphorus[2]	Turbidity[2]	Chlorophyll a[2]
	CFU/100 mL	µg/L	µg/L	µg/L	µg/L	NTU	µg/L
D1	1.30	1.62	2.84	105	8.50	0.25	0.26
D2	1.39	1.28	3.74	107	8.67	0.23	0.19
D3	1.33	1.40	4.38	119	8.72	0.21	0.22
D4	1.33	1.15	2.23	111	8.48	0.26	0.2
D5	1.41	1.20	1.94	114	8.17	0.25	0.27
D6	1.09	--	--	--	--	--	--
E1	1.31	1.79	2.41	116	8.35	0.24	0.23
E2	1.32	1.85	3.36	110	8.75	0.27	0.17
E3	1.35	1.62	6.53	120	8.82	0.22	0.21
E4	1.69	1.94	3.23	103	8.44	0.22	0.18

Station	Highest Annual Geometric Mean[1]						
	Enterococcus	Nitrate + Nitrite Nitrogen[2]	Ammonia Nitrogen[2]	Total Nitrogen[2]	Total Phosphorus[2]	Turbidity[2]	Chlorophyll a[2]
	CFU/100 mL	µg/L	µg/L	µg/L	µg/L	NTU	µg/L
E5	1.23	2.12	2.94	108	9.22	0.26	0.2
E6	1.13	--	--	--	--	--	--
Water Quality Standard	35	5.0[3]	3.5[4]	150	20	0.50	0.30[5]

[1] Source: Monthly and Quarterly DMR's submitted by the Permittee from 2009 through 2013.
[2] Reported geometric mean is the maximum annual geometric mean from the top, middle, and bottom sampling points at each station.
[3] The highest annual geometric mean for a control station was 8.06 ug/L in 2012 at E5-Botton.
[4] The highest annual geometric mean for a control station was 9.97 ug/L in 2011 at E3-Middle.
[5] The highest annual geometric mean for a control station was 0.32 ug/L in 2012 at D5-Bottom.

3. Proposed Receiving Water Limitations

a. Basic Water Quality Criteria Applicable to the Facility

(1) The discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the DOH, as required by the Water Quality Act of 1987 (P.L. 100-4) and regulations adopted thereunder. The DOH adopted water quality standards specific for open coastal waters in HAR, Chapter 11-54. The draft permit incorporates receiving water limitations and requirements to ensure the facility does not exceed applicable water quality standards.

(2) Mamala Bay is designated as "Class A Wet Open Coastal Waters." As such, the discharge from the facility shall not interfere with the attainment or maintenance of that water quality which assures protection of public water supplies and the protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife and allows recreational activities in and on the water. The draft permit incorporates receiving water limitations for the protection of the beneficial uses of Mamala Bay.

The Permittee is required to comply with the HAR, Chapter 11-54, Basic Water Quality Criteria of which has been incorporated as part of the draft permit under Section 1 of the DOH Standard NPDES Permit Conditions, dated December 30, 2005.

(3) The following criteria are included in HAR, Section 11-54-8(b) for recreational areas in marine recreational waters:

(a) Within 300 meters (1,000 feet) of the shoreline, including natural public bathing or wading areas, enterococcus content shall not exceed a geometric mean of 35 CFU per 100 milliliters in not less than

five (5) samples which shall be spaced to cover a period between 25 and 30 days. No single sample shall exceed the single sample maximum of 104 CFU per 100 milliliters.

Based on the State Enterococcus standard at the time of reissuance, the previous permit included a geometric mean of 7 CFU per 100 milliliters but did not establish a single sample maximum. However, as explained by the DOH in *Rationale for Proposed Revisions to Hawaii Administrative Rules Title 11 Department of Health Chapter 54 Water Quality Standards*, the State enterococcus standard of 7 CFU per 100 milliliters was based mainly on a health risk assessment, not as a regulatory limit. In the rationale, the DOH recommended that the State enterococcus water quality standard be revised to a geometric mean of 35 CFU per 100 milliliters and a single sample maximum value of 104 CFU per 100 ml to be consistent with federal standards. The new standards were adopted by the DOH on June 15, 2009, and approved by the EPA on March 19, 2010. The draft permit establishes the new enterococcus standards from HAR, Section 11-54-8(b) for recreational waters within 300 meters (1,000 feet) of shoreline. Since the new water quality standards were adopted by the DOH and EPA for all marine recreational waters, DOH has determined that the impact the new water quality standards established in the draft permit will be insignificant and the level of water quality necessary to protect the existing uses will be maintained and protected.

As discussed in Part D.2.h of this Fact Sheet, the WQBELs established end-of-pipe is based on federal criteria for enterococcus. Because State standards within 300 meters of shore are more stringent than the applicable federal criteria, State standards have been applied as receiving water limitations for the protection of human health.

(b) At locations where sampling is less frequent than five samples per 25 to 30 days, no single sample shall exceed the single sample maximum nor shall the geometric mean of these samples taken during the 30-day period exceed 35 CFU per 100 milliliters.

(c) Raw or inadequately treated sewage, sewage for which the degree of treatment is unknown, or other pollutants of public health significance, as determined by the director of health, shall not be present in natural public swimming, bathing, or wading areas. Warning signs shall be posted at locations where human sewage has been identified as temporarily contributing to the enterococcus count.

The draft permit establishes these criteria for recreational areas, as described in Part C of the draft permit, to be consistent with HAR, Section 11-54-8(b).

(4) As discussed in Part D.2.h of this Fact Sheet, federal criteria for enterococcus established at 40 CFR 131.41 is applicable to the receiving water at the point of discharge. WQBELs for enterococcus have been established end-of-pipe. Compliance with the WQBELs is expected to be protective of the federal criteria, thus receiving water limits beyond 300 meters from shore have not been established.

b. Specific Criteria for "Class A Wet Open Coastal Waters"

Table F-14. Specific Criteria for "Class A Wet Open Coastal Waters"

Parameter	Units	Geometric mean not to exceed the given value	Not to exceed the given value more than 10% of the time	Not to exceed the given value more than 2% of the time
Total Nitrogen	µg/L	150.00	250.00	350.00
Ammonia Nitrogen	µg/L	3.50	8.50	15.00
Nitrate + Nitrite Nitrogen	µg/L	5.00	14.00	25.00
Total Phosphorus	µg/L	20.00	40.00	60.00
Light Extinction Coefficient	k units	0.20	0.50	0.85
Chlorophyll a	µg/L	0.30	0.90	1.75
Turbidity	NTU	0.50	1.25	2.00
pH	standard units	Shall not deviate more than 0.5 standard units from a value of 8.1, except at coastal locations where and when freshwater from stream, stormdrain, or groundwater discharge may depress the pH to a minimum level of 7.0.		
Dissolved Oxygen	mg/L	Shall not be less than 75 percent saturation, determined as a function of ambient water temperature and salinity.		
Temperature	°C	Shall not vary more than 1°C from ambient conditions.		
Salinity	ppm	Shall not vary more than 10 percent from natural or seasonal changes considering hydrologic input and oceanographic factors.		

The specific water quality criteria listed at HAR, Section 11-54-6(b)(3) for "Class A, Wet Open Coastal Waters" shall apply to the treated wastewater through Outfall Serial No. 001, as seen in the table above.

The discharges from Outfall Serial No. 001 shall comply with the values listed in Table F-14 for light extinction coefficient, turbidity, and dissolved oxygen at the edge of the ZID and shall comply with water quality standards for all other pollutants listed in Table F-14 beyond the ZOM.

These requirements are consistent with HAR, Chapter 11-54, and retained from the previous permit.

c. Zone of Initial Dilution (ZID) and Zone of Mixing (ZOM)

Federal regulations at 40 CFR 125.62(a) requires that at the time a 301(h) modification becomes effective, the Permittee's outfall and diffuser must be located and designed to provide adequate initial dilution, dispersion, and transport of wastewater such that the discharge does not exceed, at and beyond the ZID, all applicable State water quality standards and, for pollutants for which there are no EPA-approved standards. EPA's Amended Section 301(h) Technical Support Document (1994) describes the ZID as the area around the diffuser circumscribed by the distance "d" from any point of the diffuser, where "d" is equal to the water depth. The ZID dimensions for the facility as defined in EPA's TDD are 469.5 feet wide and 3,860.2 feet along the centerline of the diffuser.

HAR, Chapter 11-54 allows for a ZOM , which is a limited area around outfalls to allow for initial dilution of waste discharges, if the ZOM is in compliance with requirements in HAR, Section 11-54-9(c). The Permittee has requested that the existing ZOM for the assimilation of treated wastewater from the Mamala Bay be retained. Consistent with the current permit, the ZOM requested is 1,400 feet wide and 4,800 feet along the centerline of the diffuser, and extends vertically downward to the ocean floor. The center of the ZOM is located at Latitude 21°16'58"N and Longitude 157°54'21"W, with the major axis located on the azimuth of 80° 01' 40" from the south. Figure 2 in the draft permit shows the ZOM and ZID.

(1) Prior to the renewal of a ZOM, the environmental impacts, protected uses of the receiving water, existing natural conditions, character of the effluent, and adequacy of the design of the outfall must be considered. The following findings were considered:

(a) The Permittee's ZOM application indicates that annual analysis of the effects on the receiving waters, benthic sediment grain size distribution and a Mamala Bay Study indicate that no major physical effects are expected due to the continuation of the ZOM.

Data from 2000 through 2010 summarized in the Permittee's 2010 Fish Monitoring Report shows fish abundance and distribution fluctuate in the outfall vicinity through different years, but does not show any long term trends between fish catches and the discharge from the outfall.

An additional study conducted in 1998 using a remotely controlled video camera system to document fish near the diffuser from 1991 through 1997 indicate that the number of fish species identified has not been negatively impacted.

Historical reports (1995, 1996, and 2005) on necropsy of liver histopathology findings for fish sampled from a control station in Maunalua Bay and the Sand Island Outfall conducted by the Department of Land and Natural Resources indicate no gross or microscopic pathologic changes observed which would indicate the sewage discharged at the Sand Island Municipal Outfall had an impact on the health of the fish studied in the survey.

Based on the limited data and studies, there is no current evidence that the outfall or the existing ZOM is adversely impacting fish health or community structure.

(b) The diffuser for Outfall Serial No. 001 reportedly provides a minimum of 103:1 dilution and discharges approximately 9,000 feet offshore. No information provided in the ZOM application indicates that dilution would be negatively impacted by current conditions.

(c) Effluent data and receiving water data are provided in Tables F-7, F-10, F-11, F-12, and F-13 of this Fact Sheet. As discussed above, biological monitoring of the Facility's diffuser found that no evidence of negative impacts to fish populations due to the diffuser were identified.

(2) HAR, Section 11-54-9(c)(5) prohibits the establishment of a ZOM unless the application and supporting information clearly show: that the continuation of the ZOM is in the public interest; the discharge does not substantially endanger human health or safety; compliance with the WQS would produce serious hardships without equal or greater benefits to the public; and the discharge does not violate the basic standards applicable to all waters, will not unreasonably interfere with actual or probably use of water areas for which it is classified, and has received the best degree of treatment or control. The following findings were made in consideration of HAR, Section 11-54-9(c)(5):

(a) The Facility treats domestic wastewater from the southern to southeastern portion of the Island of Oahu, serving ~404,987 people and is a necessity for public health. There are no other treatment facilities currently servicing this area and a cessation of function or operation would cause severe hardship to the residents.

(b) No known information indicates that the discharge is causing or contributing to conditions that substantially endanger human health or safety. The Permittee reports there have been no reported cases of illness which health officials attributed to the treated effluent and that enterococcus bacteria data does not indicate a shoreward movement of the effluent discharged 9,000 feet offshore.

(c) The feasibility and costs to install treatment necessary to meet applicable WQS end-of-pipe, or additional supporting information, were not provided by the Permittee to demonstrate potential hardships. However, based on effluent data, significant Facility enhancements and capital costs would likely be necessary to comply with applicable WQS for which the ZOM was applied. As discussed in Part E.3.c.(2)(a), the operation of the Facility has been found to benefit the public. No information is known that would revise the finding during the previous permit term that compliance with the applicable WQS without a ZOM would produce serious hardships without equal or greater benefits to the public.

(d) As discussed in Part D.2.c.(5)(c) of this Fact Sheet, effluent data indicates the presence of pollutants in excess of applicable WQS. However, this permit establishes water quality-based effluent limitations based on WQS. The Permit requires compliance with the effluent limitations and conditions which are protective of the actual and probable uses of the receiving water and implement applicable technology-based effluent limitations.

The Department has determined that the ZOM satisfies the requirements in HAR, Section 11-54-09(c)(5).

Based on the finding that the ZOM satisfies the applicable requirements, pollutants for which a ZOM has been previously approved will retain the ZOM. These pollutants include total nitrogen, ammonia nitrogen, nitrate + nitrite nitrogen, total phosphorus, chlorophyll a, pH, temperature, and salinity.

For receiving water limitations previously not granted a ZOM, the applicable water quality standards must be met at that ZID. These pollutants include light extinction coefficient, turbidity, and dissolved oxygen. In EPA's TDD, EPA concluded that the discharge would consistently attain the Hawaii water quality standard for dissolved oxygen, turbidity, and light extinction coefficient. As such, the cost of establishing individual receiving water monitoring locations for these parameters along the ZID is not warranted. Consistent with the approach in the previous permit, monitoring for dissolved oxygen, turbidity, and light extinction coefficient shall be conducted at the ZOM stations.

The establishment of the ZID and ZOM is subject to the conditions specified in Part D of the draft permit. The draft permit incorporates receiving water monitoring requirements which the DOH has determined are necessary to evaluate compliance of the Outfall Serial No. 001 discharges with the applicable water quality criteria, as described further in section F.4 of this Fact Sheet.

F. Rationale for Monitoring and Reporting Requirements

40 CFR 122.41(j) specify monitoring requirements applicable to all NPDES permits. HAR, Section 11-55-28 establishes monitoring requirements applicable to NPDES permits within the State of Hawaii. 40 CFR 122.48 and HAR, Section 11-55-28 require that all NPDES permits specify requirements for recording and reporting monitoring results. The principal purposes of a monitoring program are to:

- Document compliance with waste discharge requirements and prohibitions established by the DOH;
- Facilitate self-policing by the Permittee in the prevention and abatement of pollution arising from waste discharge;
- Develop or assist in the development of limitations, discharge prohibitions, national standards of performance, pretreatment and toxicity standards, and other standards; and,
- Prepare water and wastewater quality inventories.

The draft permit establishes monitoring and reporting requirements to implement federal and State requirements. The following provides the rationale for the monitoring and reporting requirements contained in the draft permit.

1. Influent Monitoring

Influent monitoring is required to determine the effectiveness of pretreatment and non-industrial source control programs, to assess the performance of treatment facilities, and to evaluate compliance with effluent limitations. All influent monitoring requirements have been retained from the previous permit. Additionally, influent monitoring for DDT has been established in the draft permit in order to determine if DDT is present in the influent in elevated concentrations. The proposed influent water monitoring requirements are specified in Part A.1 of the draft permit.

2. Effluent Monitoring – Outfall Serial No. 001

The following monitoring requirements are applicable at Outfall Serial No. 001.

a. Monitoring requirements for total nitrogen and total phosphorus are retained from the previous permit to enable comparison with the receiving water ZOM monitoring results determine if the facility effluent is contributing to elevated concentrations of said pollutants.

b. Monitoring requirements for ammonia nitrogen have been added to the draft permit to evaluate compliance with applicable effluent limitations and enable comparison with the receiving water ZOM monitoring results to determine if the facility effluent is contributing to elevated concentrations of ammonia nitrogen. Monitoring requirements are consistent with monitoring requirements for other nutrients.

c. Monitoring requirements for nitrate + nitrite nitrogen and turbidity have been added to the draft permit to enable comparison with the receiving water ZID monitoring results to determine if the facility effluent is contributing to elevated concentrations of nitrate +nitrite nitrogen and turbidity.

d. Monitoring requirements for flow have been retained from the previous permit to calculate pollutant loading and to determine compliance with mass-based effluent limitations.

e. Monitoring requirements for temperature have been retained from the previous permit to determine compliance with water quality standards.

f. Monitoring requirements for pH, BOD_5, chlordane, dieldrin, enterococcus, and TSS have been retained from the previous permit in order to determine compliance with effluent limitations and to collect data for future RPAs.

g. Monitoring requirements for total oil and grease; total petroleum hydrocarbons; and fats, oils, and grease have been retained from the previous permit to ensure that the facility is meeting the basic water quality criteria contained in HAR, Section 11-54-4(a), which states all waters shall be free of “Floating debris, oil, grease, scum, or other floating materials,” and in the DOHs Standard NPDES Permit Conditions, December 2005, which is included as an attachment to the draft permit.

h. Monitoring requirements for DDT have been established in the draft permit to determine compliance with newly established effluent limitations and to collect data for future RPAs.

i. Monitoring requirements for all other pollutants listed in Appendix 1 are retained from the previous permit in order to collect data for future RPAs.

3. Whole Effluent Toxicity Monitoring

Consistent with the previous permit, monthly whole effluent toxicity testing is required in order to determine compliance with whole-effluent toxicity effluent limitations as specified in Parts A.1 and B of the draft permit.

4. Receiving Water Quality Monitoring Requirements

a. Shoreline Water Quality Monitoring

Shoreline water quality monitoring for enterococci is used to determine compliance with water quality criteria specific for marine recreational waters within 300 meters (1,000 feet) of shoreline, as described in Part C of the draft permit. The Permittee shall monitor at five stations with a frequency of seven (7) days per month in order to calculate a geometric mean. These monitoring requirements are retained from the previous permit and included in Part E.1 of the draft permit.

b. Nearshore Water Quality Monitoring

Nearshore water quality monitoring is required to determine compliance with State water quality standards, as described in Part D of the draft permit. The draft permit requires the Permittee to monitor recreational waters at three (3) stations, R1 through R3. Although these stations are called recreational waters, they are beyond 300 meters (1,000 feet) from shore and, therefore, monitoring at these stations is not intended for compliance with specific water quality criteria for recreational areas in Part C of the draft permit.

In addition to station R1 through R3, the draft permit requires the Permittee to also monitoring nearshore waters at five stations: C1A, C2A, C3A, C4 and C5A. The previous permit required the Permittee to monitor at stations C1, C2, C3, and C5 rather than C1A, C2A, C3A, and C5A. These stations have been amended from the previous permit because the old stations did not have sufficient benthic material. The new stations are in the same vicinity as the old stations. All other monitoring requirements for the nearshore stations are retained from the previous permit and included in Part E.2 of the draft permit.

Further, receiving water monitoring is necessary to evaluate the impact of the discharge on the receiving water, consistent with Section 403(c) of the CWA.

c. Offshore Water Quality Monitoring

Offshore water quality monitoring is required to determine compliance with State water quality standards, as described in Part D of the draft permit. The draft permit requires the Permittee to monitor offshore waters at five stations along the 50 meter (165 foot) contour, D1 through D5, and five stations along the 100 meter (328 foot) contour, E1 through E3. All monitoring requirements for offshore stations are retained from the previous permit and included in Part E.3 of the draft permit.

Further, receiving water monitoring is necessary to evaluate the impact of the discharge on the receiving water, consistent with Section 403(c) of the CWA.

d. Nearshore and Offshore Sediment Monitoring

Nearshore and offshore sediment monitoring is required to detect spatial and temporal trends in sediment pollutants and benthic organisms. The draft permit requires the Permittee to monitor nearshore and offshore sediments for chemistry and benthic organisms at the following stations:

Location	Station Name	Number of Samples at Each Station (Including Replicates)	
		Chemistry	Benthic Organisms
Nearshore	C1A	2	3
	C2A	2	3
	C3A	2	3
	C5A	2	3
Offshore	D1	2	3
	D2	2	3
	D3	2	3
	D5	2	3
	E1	1	3
	E2	1	3
	E3	1	3
	E5	1	3

The previous permit also required monitoring at Stations C4, D4, and E4. However, Stations C4, D4, and E4 do not have sufficient sand to sample sediment. Therefore, these monitoring stations have not been retained from the previous permit. All other nearshore and offshore sediment monitoring requirements have been retained from the previous permit.

Further, receiving water monitoring is necessary to evaluate the impact of the discharge on the receiving water, consistent with Section 403(c) of the CWA.

e. Fish Monitoring

Fish monitoring is required at three locations, at the outfall and at two (2) fish monitoring stations (FR3 and FR4), to determine if fish are being negatively affected by effluent discharged at Outfall Serial No. 001 compared to the control stations. The previous permit required fish tissue to be monitored at FR1 and FR2. The draft permit requires fish tissue to be monitored at the outfall and at control stations FR3 and FR4, instead of control stations FR1 and FR2 established in the previous permit. The new control stations are located southwest and west of Oahu. During the term of the previous permit, crews collecting samples at FR1 and FR2 have reported difficulty due to strong winds and rough seas. The new stations are being established to enhance the safety of the crew collecting the samples. In addition, recent data collected from around the outfall have indicated no problems when compared to the existing control stations. Therefore, collecting fish at the

new control stations will continue to allow comparison to Hawaii fish away from Outfall Serial No. 001. All other fish tissue monitoring requirements have been retained from the previous permit.

Further, receiving water monitoring is necessary to evaluate the impact of the discharge on the receiving water, consistent with Section 403(c) of the CWA.

f. Assimilative Capacity and Zone of Mixing Confirmation Study

Dilution has been provided within this permit for ammonia nitrogen based on an analysis of the available receiving water date and the determination that assimilative capacity currently exists. The Permittee is required to conduct a study evaluating the assimilative capacity as specified in Part E.6 of the permit to confirm dilution remains applicable for ammonia nitrogen over the term of this permit and for future permitting efforts.

G. Rationale for Provisions

1. Standard Provisions

The Permittee is required to comply with DOH Standard NPDES Permit Conditions, which are included as part of the draft permit.

2. Monitoring and Reporting Requirements

The Permittee shall comply with all monitoring and reporting requirements included in the draft permit and in the DOH Standard NPDES Permit Conditions.

3. Special Provisions

a. Reopener Provisions

The draft permit may be modified in accordance with the requirements set forth at 40 CFR 122 and 124, to include appropriate conditions or limitations based on newly available information, or to implement any new state water quality criteria that are approved by the EPA.

b. Special Studies and Additional Monitoring Requirements

(1) Toxicity Reduction Requirement. The draft permit requires the Permittee to submit an initial investigation Toxicity Reduction Evaluation (TRE) workplan to the Director and EPA which shall describe steps which the Permittee intends to follow in the event that toxicity is detected. This requirement is retained from the previous permit and is discussed in detail in Part B.2 of the draft permit.

4. Special Provisions for Municipal Facilities

a. Pretreatment Requirements

The federal CWA Section 307(b), and federal regulations, 40 CFR 403, require POTWs to develop an acceptable industrial pretreatment program. A pretreatment program is required to prevent the introduction of pollutants, which will interfere with treatment plant operations or sludge disposal, and prevent pass through of pollutants that exceed water quality objectives, standards or permit limitations. Pretreatment requirements are imposed pursuant to CWA Sections 307(b), (c), (d), and 402(b), 40 CFR 125, 40 CFR 403, and in HAR, Section 11-55-24.

The Permittee's pretreatment program was submitted to EPA in 1979 and received approval on July 29, 1982. The Permittee submitted a revised program on June 9, 1994 but no formal approval was issued. On October 16, 1998, the Permittee further streamlined their program. There are currently 21 non-categorical significant industrial users, include eight food/drink manufacturing, four food catering, four printing, and five laundry.

The draft permit includes a pretreatment program in accordance with federal regulations and State pretreatment regulations. The pretreatment requirements are based on previous permit and are consistent with NPDES permits issued to other Hawaii POTWs. The draft permit also continues to require the Permittee to implement and update its BMP-based program for controlling animal and vegetable oil and grease.

Large applicants for a modified NPDES permit under section 301(h) of the CWA with a service population greater than 50,000 that receives one or more toxic pollutants from an industrial source are required to comply with urban area pretreatment requirements at 40 CFR 125.65. The draft permit requires the Permittee to comply with urban area pretreatment requirements since the facility continues to operate as a primary treatment plant.

b. Biosolids Requirements

The use and disposal of biosolids is regulated under federal laws and regulations, including permitting requirements and technical standards included in 40 CFR 503, 257, and 258. The biosolids requirements in the draft permit are in accordance with 40 CFR 257, 258, and 503, are based on the previous permit and are consistent with NPDES permits issued to other Hawaii POTWs.

5. Other Special Provisions

a. Water Pollution Control Plan. The draft permit requires the Permittee to submit a wastewater pollution control plan by March 31 each year. This

provision is retained from the previous permit and is required to allow DOH to ensure that the Permittee is operating correctly and attaining maximum treatment of pollutants discharged by considering all aspects of the wastewater treatment system. This provision in included in Part F of the draft permit.

b. Wastewater treatment facilities subject to the draft permit shall be supervised and operated by persons possessing certificates of appropriate grade, as determined by the DOH. If such personnel are not available to staff the wastewater treatment facilities, a program to promote such certification shall be developed and enacted by the Permittee. This provision is included in the draft permit to assure that the facility is being operated correctly by personnel trained in proper operation and maintenance. This provision is retained from the previous permit and included in Part J.1 of the draft permit.

c. The Permittee shall maintain in good working order a sufficient alternate power source for operating the wastewater treatment and disposal facilities. This provision is retained from the previous permit in order to ensure that if a power failure occurs, the facility is well equipped to maintain treatment operations until power resumes. If an alternate power source is not in existence, the draft permit requires the Permittee to halt, reduce, or otherwise control all discharges upon the reduction, loss, or failure of the primary source of power. This provision is included in Part J.2 of the draft permit.

H. Public Participation

Persons wishing to comment upon or object to the proposed draft NPDES permit in accordance with HAR, Sections 11-55-09(b) and 11-55-09(d), may submit their comments in writing either in person or by mail, to:

Clean Water Branch
Environmental Management Division
919 Ala Moana Boulevard, Room 301
Honolulu, HI 96814-4920